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From our observation of cementum to which caries has extended, we conclude that the process there is very similar; the bioplasmic contents of the lacunæ and canaliculi afford board and lodging for the organisms, which multiply, and when sufficiently numerous, decalcify the surrounding bone so that the lacuna loses its outlined and extends in all directions.

With regard to the pulp, its inflammation does not materially differ from that of any other cellular connective tissue. The influence of germs upon such tissues, when inflamed, has been already demonstrated by Professor Lister. One peculiarity distinguishes this from kindred tissues, and that is that a tooth being an absolutely shut box, its contents are singularly amenable to antiseptic treatment. Having once rendered them aseptic by means of a penetrating agent, it is easy to keep them absolutely so, by sealing the only opening of the cavity with a filling. With a view of testing this fact, the theoretical accuracy of which we could not doubt, we have repeatedly allowed the gangrenous contents of a pulp cavity in which suppurative inflammation has gone on, to remain in the tooth covered by a filling.

All that is necessary to prevent further disturbance is to soak them in a powerful antiseptic. I have chosen for this purpose a combination of iodoforn and eucalyptus oil, because it is the most powerful and the most permanent in its effects. After a certain period, during which the cavity has been sealed with a temporary filling, if no disturbance has occurred, I have substituted a permanent filling, and almost invariably with the most satisfactory results. The treatment is, I think, eminently conservative surgery and based upon sound surgical principles.

M. Magitot, in a recent most interesting article upon the development of the teeth, lays great stress upon the fact that the odontoblast layer is very essential to the health of the tooth; and if we can, by this method of dealing with the matter, avoid the otherwise necessary alternative of re-

moving it together with all dead matter, we certainly give the tooth and extra chance. The more of the natural vital contents of the pulp cavity we can preserve *in situ* the better for the the tooth.

Further, we would propose for your consideration a theory as to what is the probable course of behavior of a tooth pulp under these circumstances; at present only a theory, but one which we hope to establish shortly by occular demonstration, and lay before you in a mature form. Suppose a tooth, with a large cavity communicating with the pulp-chamber; suppose that gangrene and suppuration have extended down two-thirds of the pulp-chamber, and that the extreme periphery of the pulp (membrana eboris,) and the contents of the apex of the root alone remain alive; suppose the cavity cleared, a small portion of the surface of the slough removed, and the rest carefully soaked with eucalyptus oil until all the existing organisms are destroyed and the cavity then filled with a permanent and effectual stopping, what becomes of the slough? In every other part of the body a slough that has been rendered and kept aseptic is gradually absorbed by the neighboring vessels, while new cicatricial connective tissue is laid down in its place, this has been repeatedly demonstrated in sloughs of the limbs treated antiseptically. We therefore suggest that the same thing that happens in other parts of the body, under similar circumstances, happens in the pulp-chamber; the slough is removed gradually by absorption, while its place is supplied by healthy cicatricial tissue; like all scar tissues, it is of a lower order than that which it replaces, but it is a living tissue. After a lapse of time, then, we imagine that if the tooth in question were extracted and split open, its contents would be found to be a healthy connective tissue, and not a slough at all.

### EXPERIMENTS ON THE LIVING SUBJECT.

Taking, then, for granted the facts established by Lister and others, relative to the effects of the presence of organisms in other tissues, we were convinced that the course of

an alveolar abscess was also profoundly modified by their presence. An aseptic or a septic alveolar abscess seemed to us to differ very much in the same way as a simple and a compound fracture.

To render such abscesses aseptic, we have injected them with eucalyptus oil and iodoform, and dressed them with lint soaked in these substances.

By means of constant and careful dressings and injections, we have been for the last two years very successful in inducing extensive, and often old standing alveolar abscess to run a rapid aseptic course of recovery. Wherever we have failed we have been able to trace our failure to the presence of a sequestrum, which has afforded an inaccessible refuge for organisms, and which, until nature has rejected it, or surgical skill removed it, has kept up the mischief despite all applications. Mr. David Hepburn, in a recent able paper read before the Odontological Society, urged this fact very strongly and clearly, and we quite agree with him that, while dead boue is present, antiseptics may mitigate, but are powerless to annihilate the disease.

MICROSCOPICAL.

The sections from which our observations have been made have been cut from fresh teeth, very shortly after extraction, and without the use of any decalcifying or softening re-agent.

We have subsequently stained them with an aniline dye (methyl violee,) following as closely as possible that recommended by Koch—a process which renders micrococci fairly distinct under a $\frac{1}{8}$ lens, with proper illumination. A few typical slides we have been enabled to show you, owning to the kindness of our friend, Mr. Nelson. I need scarcely add that as the powers are very high oil immersions (1–60, 1–32, 1–25,) we shall ask you to refrain from touching the adjustments. We have also prepared some diagrams illustrating upon a larger scale the appearance of the objects. In dentine, which has occupied most of our attention, we have invariabiy discovered the chan-

nels containing the dentinal fibrils more or less infiltrated with germs—for the most part micrococci, oval and rod-shaped bacteria. These germs we find penetrating, at first in Indian file, then more thickly, along the course of the fibrils. As they accumulate and choke up the channels they encroach upon the matrix, diminishing the distance between the fibrils until the matrix entirely disappears, the neighboring channels join, and the whole tissues becomes one conglomerated mass of organisms. Beyond the sphere of visible decay, sections cut from apparently healthy tissue show here and there a narrow line of micrococci or bacteria, like an advanced guard, and such insulated tubes or germs probably penetrate far into tissue which the naked eye would pronounce sound.

In decay which has appeared in blocks of hippopotamus ivory worn on a plate, we have observed very similar appearances, also in some caries which we have produced ourselves in a flask, by exposing a sound tooth to septic agencies.

In cementum hitherto we have experienced some difficuty in obtaining sections of tissue into which caries has penetrated; but where we have succeeded we have found the lacunæ filled with germs. In some lacunæ the protoplasm of the osteoblast cell is slightly stained, the nucleus very deeply, and a few germs are seen scattered about in little groups. In others the protoplasmic contents of the space appear to have been totally destroyed, the outline lost, and the whole lacuna crowded with germs.

### SUMMARY.

The preceding observations, together with the experiments with flasks and upon the living subject above referred to, have lees to us to adopt certain views which may be regarded as an extension of the views previously held upon the matter.

1. We consider that caries is absolutely dependent upon the presence and prolification of organisms. That those organisms attack first the organic material, and feeding

upon it, create an acid which removes the lime salt, and that all the differences between caries and simple decalcification by acids is due to the presence and operation of germs. This view we propose to call the "septic theory."

2. That suppuration of the pulp and its sequelæ, such as alveolar abscess, depend also upon the successful working of organisms.

3. We feel justified in concluding that the successful exclusion of germs would prevent the disease, and that their exclusion is quite easy and practicable by the use of powerful and penetrating antiseptic agents, such as eucalyptus oil.

We have found that the space of time allotted to a paper rendered it quite impossible to enter into all the details of treatment and experiment we could wished. These experiments have extended over three years, and cannot be condensed into an half-hour paper. All therefore, that we have been able to do has been to lay before you the main facts and a few typical results, and in doing so we have been very kindly assisted by Mr. Nelson, whose microscopical arrangements have enabled us to show you our results in a more perfect manner than would have been otherwise possible.—*Journal of the British Dental Association.*

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## ARTICLE II.

### *Characteristics of Saliva in Syphilitics.*

BY DR. A. W. HARLAN, OF CHICAGO.

Not very much will be said concerning the saliva of persons infected with the virus of syphilis, for in most cases there is no appreciable difference existing between such saliva and that from the mouth of a perfectly healthy subject. It is not my purpose to dwell on the characteristics of syphilitic saliva, for the reason that they have no practical bearing in connection with the practice of dentistry,

except as shall be mentioned further along; but the lesions of the mouth, resulting from inherited and acquired syphilis, are so numerous in form and variety, and are often destructive to the bones of the nose and mouth, that it is incumbent on all dental surgeons to be familiar with their appearance, duration, and treatment, primarily for the benefit of the patient, and secondarily for self protection. Therefore, it has been suggested that a brief resume of the order, character, and general appearance of mouth lesions may not prove uninteresting. Saliva from the mouth of a person suffering with syphilis in its second stage presents only this marked physical difference from saliva in general; a sufficient quantity collected for the purpose is poured into a vessel containing water; it sinks more quickly and does not mingle with the water to readily as non-syphilitic saliva; on testing, it is found to contain more albuminous matter, and when there are extensive patches and erosions of the mouth and pharynx, it is secreted in abundance, accompained by increase in size of the submaxillary glands; during the eruptive period of syphilis it is very much lessened in volume and gives an acid reaction. Saliva is the only one of the physiological secretions which is apt to be the vehicle in spreading the poison of syphilis, examples of which are here presented:—

In one case a sailor went from house to house tattooing, and was observed to wet the needles in his mouth before pricking in the colors. Fifteen out of twenty-two persons tattooed had acquired syphilis. On examination his mouth and throat were found covered with ulcers and erosions; the pus mingling with the saliva being pricked in with the coloring matter caused the inoculation. Two persons were indiscreet enough to use a tooth-brush which had previously been used by a syphilitic; they both acquired the disease. An old Frenchman smoked a pipe which had been used only a short time previously by a syphilitic friend, and in due course the initial chancre appeared on his lip. By searching the literature of syphilis, numerous

cases may be found where kissing has been the means of communicating the disease. Two cases are reported in Woods Library of Medical Science, 1880, volume on venereal diseases, by E. L. Keyes, M. D. In twelve thousand cases reported from hospitals, three and one third per cent. exhibited the primary sore on the lip or within the mouth; more than ninety-four per cent. of the remainder showed the chancre on the genitals or anus. Whistles and trumpets sold on the streets and wet with the saliva of the venders may be infectious. In some regions where glass-blowing establishments are numerous, laws have been enacted to prevent the use of the mouth-tubes, except by the owners, on account of the liability of communicating syphilis. Any article used by a syphilitic in the mouth when it is eroded or covered with ulcerous patches, may inoculate the innocent user, if it be not thoroughly cleansed. Many an innocent nurse has acquired syphilis by suckling a child inheriting it, as the mouth lesions appear so early in most cases that they are unable to escape unless the nipple remains unbraded. There are some who believe that the twisted end of a new cigar having been wet with saliva of a syphilitic may be contagious. The use of the rubber dam in the mouth of a syphilitic, and its subsequent use in the mouth of another, without perfect cleansing, might prove infectious; it would be if any blood were adherent, as it is known to be infectious. Forceps that have been used and not thoroughly cleansed; scalers and lancets, particularly abscess lancets, and other instruments used by dentists, oculists, and aurists, unless properly cleansed, would spread syphilis. (See Bumstead and Taylor, E. L. Keyes, and Ziemssen, on venereal diseases, for instances of infection by unclean instruments.) In circumcision and vaccination numerous cases are reported, especially in the latter. In transplanting teeth it would be possible to communicate syphilis, but J. Hunter's claim that because an abscess formed opposite the root of the transplanted tooth in three or four weeks after the operation, that it was a

chancre, is of course erroneous; the abscess appeared because the pulp was not removed from the tooth, and in three or more weeks it decomposed and the gas had to have exit; hence the abscess. It is impossible to point out the numerous methods of acquiring syphilis in a brief paper. Suffice it to say that we cannot be too careful of our own fingers or our patients' mouth in any suspected case.

An abrasion or a surface capable of absorption, if it have, in contact with it, the poison of syphilis for a sufficient period of time, no matter where the spot be located, is as sure to exhibit the chancre as it is sure to result from sexual contact when one of the persons is diseased. From the fact that persons who acquire syphilis usually resort to the venereal specialist, dentists generally may be ignorant of the cause of the disease in its primary form, except from reading or when medically educated; but when the secondary symptoms progress far enough to exhibit excoriations, erosions, ulcers, and mucous patches in the mouth and throat, the dermatologist necessarily sends his patient to a dentist in order that all tartar shall be removed from the teeth, rough corners filed off and pieces of root removed, ill-fitting dentures trimmed and polished, so that the tongue, cheeks, and lips may be free from such sources of irritation. If the person infected falls into the hands of a dentist before consulting a physician, his knowledge of the clinical features of the disease ought to enable him to attend to the hygiene of the mouth so effectually that the treatment of the case constitutionally may be left to the venereal specialist until a cure is effected.

An outline may now be presented of the course of syphilis. After contact with the poison a chancre appears in three or four weeks, or longer; the chancre always appears at the point of inoculation; in two weeks thereafter the adjacent lymphatic glands enlarge, but seldom suppurate. After a month or six weeks has elapsed, an eruption on the skin, which may be quite general, appears, usually preceded by slight fever, accompained by headache, rheumatic pains

at night, and an enlargement of the epi-trochlear and post-cervical glands; co-incident with these symptoms the mouth lesions are met with, consisting of mucous patches, erosions and ulcers; they are concomitant from time to time with other general symtoms of the disease during its whole course. After the expiration of a year, the mouth lesions are much worse, being usually whitened and excoriated patches, ragged ulcers upon the fauces and in the mouth, especially deep ulcers on the inside of the lower lip and opposite the last molar teeth. The tongue white and furred, which cannot be scraped off without bleeding, its edges and under surface raw, and the adjacent nasal mucous membrane covered with dark yellow and brownish scabs, a thickening and fissuring of the orifice of the nostrils, with the breath quite offensive. The mucous patch when once seen is not likely to be confounded with that from any other affection. It is nearly round and raised slightly, of a dirty white color, sometimes red or granulated, and covered with a puriform secretion; its size varies from a point to that of a large copper cent, patches occur on the tonsils, the whole of the pharynx, within the lips, the nose, trachea, larynx, and upon the tongue or under it. They are generally painless, unless surrounded by erythema, irritated by smoking, or a rough tooth, or some similar cause. A person with a mucous patch upon the lip or within it, is far more dangerous to a community than half a dozen people with developed chancres on the genitals, as may readily be seen when it is known that the secretion from it is infectious; lobbing of the tongue, which is often, observed, is generally the result of too vigorous use of mercury, and is not the result of syphilis in any stage. Chancre of the lip, which is most often seen in hospitals, is globular or orval, angry-looking, and the size of a nickel; many of you have seen it; it is highly infectious. Scaly patches appear in the mouth after two or more years, and their favorite locality is at the angle of the mouth, the tip, sides and dorsum of the tongue; frequently masses of overgrowth, with adher-

ent epithelium, cover a patch under the tongue, which, when detached, are as thick as a knife blade; in some respects they resemble icthyosis, but a close inspection of this syphilide marks its color a mottled bluish white, and no mistake need be made concerning its origin; these usually require nothing more than local treatment. Gummy tumors of the hard and soft palate come without pain, but when once formed they destroy all tissue which has become infiltrated; they are peculiarly destructive of the bones of the mouth and nose, and need to be heroically treated with the iodides or mercury, internally.

It is generally agreed that syphilis causes the most extensive mouth and throat ravages, especially destructive of bone, when no previous scrofula or lupus can be traced; hence the disfigured nasal organs and injuries of the hard and soft palate, which are frequently irreparable. Gumma of the tongue differs from epithelioma in this: it occurs at any age, has syphilitic history, commences deep, and feels like a pea between the fingers, is some times multiple, and *may always be found on the posterior aspect on the sides, but never underneath the tongue.* When ulceration takes place, it uncovers a deep cavity, and is usually painless, which is characteristic. When excised completely, it does not recur. The appearance of mouth lesions from inherited syphilis is often as early as a week from birth to a few months or even years, yet the latter occurs very rarely. Snuffling, and a general coryza, with excoriations around the nose and mouth, indicate very plainly the cause of the trouble; the child whines, its voice is cracked, and the skin drawn tightly over the face, which gives it an oldish look, but the development of patches at the angles of the lids and orifice of the nostrils, are usual and correct points in diagnosis. After the seventh year the notched superior central incisors are a sure indication of inherited syphilis. The whole train of symptoms are observed from inherited, that are seen in acquired syphilis, except that there is no chancre: the lymphatic glands do not enlarge, and the

nails are affected either by impairment of nutrition or ulcerative onychia, the latter of which is most frequently noticed.

TREATMENT.

The local treatment of mouth lesions from acquired or inherited syphilis, is perfect cleanliness, the use of a soft brush and an alkaline powder or wash; the teeth should be polished and roots be extracted or pivoted; tobacco must be forbidden; and mild astringent washes and gargles be prescribed for young children. Strong warm tea with X grs. borax to the ℥ i, or V grs. chlorate of potash to the same, are effectual for infants and children. Patches and ulcers may be painted with a solution of nitrate of silver, or solution of corrosive chloride of mercury, grs. i i j to ℥ i alcohol, daily; or when necessary they should be touched lightly and carefully with a solution of acid nitrate of mercury twice a week, or any other favorite effectual remedy may be used. If there are gummata likely to involve the bone, iodide of potassium or iodide of sodium should be prescribed in V to X gr. doses or larger, during or after meals. The sodium causes less disturbance of the stomach. If the bones of the mouth have become denuded of their periosteum, no effort should be spared to prevent further caries or necrosis, but no local remedy will be found efficient. If the dentist be timid or wanting in definite knowledge of the needs of the patient, he should be sent to his physician without loss of time. In most cases the dead bone will separate from the living during prompt and appropriate constitutional treatment. Caries must be operated upon beyond the line of decay, then pursue a systemic treatment, which, if kept up sufficiently long, will certainly result in a cure.

It is hoped that if nothing new has been presented in this paper, it will serve to stimulate the unthinking to an investigation of the subject which has been so imperfectly sketched for your consideration.

DISCUSSION.

Dr. Swain.—I have made a good many tests with a view

to find whether the normal condition of the saliva is acid or alkaline, but without satisfactory results. I found the saliva in some cases acid, and in others alkaline, in persons of equally good health and similar habits, the tests being made from fifteen minutes to half an hour after eating. In more than half the cases it was acid. Twice during the year I have had in my office a harmlessly insane young lady. In her mouth I have found the saliva uniformly acid, but her teeth do not decay. She is about thirty years old, and has only three fillings in her teeth. Stringy saliva is almost always acid, and in such mouths, when the enamel turns white and begins to decay, the free use of precipitated chalk will often check its progress.

Dr. Brophy.—Syphilis cannot be inherited from a father unless a mother has it. That is, the mother must acquire it before the child will inherit it. And it is not communicated from one person to another by the *physiological* secretions, but the saliva of syphilitic persons may often be mixed with more or less serum or pus from some abrasion on the lips or mouth.

Dr. Richards.—During the last few months I have made a great many tests of saliva, in all classes of mouths, both healthy and unhealthy. I found it alkaline in a majority of cases, and especially so in robust and healthy persons. I saw many cases of rapid decay in mouths having alkaline saliva, but between the teeth, where food was lodged and uncleanly, it was acid, and *there* was decay. If we can induce patients, after having had fillings made, to keep the proximal surfaces clean, the operations will usually be preserved. I believe a great deal of decay is caused by the food that lodges in the proximal spaces and remains till decomposed, for want of proper attention to cleanliness.

Dr. Black.—I have made many examinations of saliva with the same general results as described; but we never find decay without there being an acid condition *somewhere* in the mouth, and yet teeth do not *necessarily* decay because

the saliva is acid, though they never decay without an acid. Many patients *always* present an acid saliva whose teeth have no decay. There is some other element in this question which we have not yet found out.

Dr. Spalding.—The reports indicate that the chemical condition of the saliva does not necessarily produce decay.* If properly developed and well calcified, teeth will resist all these conditions of the saliva, it is the duty of the dental profession to find out the cause of the defective development of human teeth now so prevalent.

Dr. Black.—I wish to say this. Imperfect development is not a cause of decay, but a condition favoring it. Decay is the destruction of the tooth, molecule by molecule, by some substance attacking it from without.

Dr. Swain.—I have arrived at the same conclusions as Dr. Black and Dr. Spalding, that the saliva is not very much responsible for decay. Unquestionably, the acids generated from food lodged at the necks of the teeth will produce decay.

Dr. Black.—The secretions of the mouth as they often become vitiated while contained there, I do regard as holding a causative relation to decay.

Dr. Spalding.—I agree with Dr. Black, except that in two cases of the most rapid decay that I have seen, I could find no acid reaction at any time, in very numerous tests, in all parts of the mouth. If the presence of an acid is essential to decay, how does decay begin in these cases? I have no doubt that after it has made some progress an acid reaction might be obtained within the cavities of decay. We have only just begun to investigate or to understand this subject.

Dr. Brophy.—Alkaline secretions will injure the cementum, and alkaline washes should be used with caution, if the cementum at the necks of the teeth is exposed.

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* In this discussion the word "saliva" usually means the mixed fluids, saliva, mucus, etc., as found in the mouth.

Dr. Black exhibited photographs of a girl now thirteen years old, who at five years old lost the cheek and lips of one side by a slough caused by salivation. The lower jaw is firmly anchylosed. The development of the teeth has proceeded with this condition existing; the shedding of the temporary teeth and the growth of the permanent ones has been perfectly regular, except that the teeth stand a little outward from the normal position. The special point of interest in the case is this; The buccal surfaces of all the exposes teeth have suffered from erosion, which is precisely the same in appearance as that which we find in normal mouths. The eroded surface is hard and smooth as glass, and some of the teeth are eroded almost to the pulp cavity. These teeth have never been used in chewing food; they have not been bathed in the saliva, except as it overflows the mouth and runs out upon them, which it does a good deal. They have never been filed or cut in any way. As to this point I have the evidence of the girl herself, of her parents, and the family physician. The teeth of the opposite side have their proper covering of cheek and lips, and show no trace of erosion, and are otherwise perfectly normal. This case strikes me as furnishing a new fact in regard to abrasion or erosion of the teeth, or at least a case occurring under such novel conditions that I think it well to place it on record.—*Illinois State Dental Transactions.*

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## ARTICLE III.

### *Secondary Dentine.*

BY JOHN G. HARPER, D. D. S.

[Read before the St. Louis Dental Association, February 21, 1881.]

The pathological changes to which the dental pulp is subjected are many, and of the greatest importance to patient and practitioner. They vary from the reparative to the destructive. The particular pathological change to be

considered here is the calcification of this delicate organ. A normal pulp which has never been subjected to sufficient irritation to cause any changes in its form or structure, presents a mass which is soft, vascular and nervous, possessing a function which may, in the future, form dentine similar to that of the tooth, and called secondary dentine.

Salter, page 140, says; "The pathological change consists in the impregnation of the various tissues of the tooth-pulp with calcareous matter, their calcification, in fact, occurring in multitudes of isolated points; and by the multiplication and enlargement of these 'islands of calcification,' involving more and more of the structure of the pulp, and its ultimate conversion, under certain favorable circumstances, into osteo-dentine." * * * "When the calcification is absolutely complete, * * the whole is perfectly hard as ivory, but, until this final stage, it may be torn up with points of needles, into fibers, which in the fangs are uniformly longitudinal. The axis of the pulp solidifies first, and most completely, the exterior being more or less soft and pulpy, till the osteo-dentine is fused and confounded with the dentine."

* * * "The color is also modified by the change, according to the degree of calcification that has taken place; from pink and semi-transparent, it becomes white and opaque, and when the calcification is complete, and the islands have fused together, it is yellowish and horny-looking." * * * "The blood vessels are probably the last tissues to calcify, and this is certainly the case with the larger ones, some of which remain permanently patent and functional in the axis of Haversian systems of the matured osteo-dentine."

Secondary Dentine may be divided into three classes, viz.: Dentine of Repair, Dentine Excrescence, and Osteo-Dentine, or Intrinsic Calcification.—(Tomes.)

Dentine of Repair is formed for the protection of the dental pulp from external influences, and we know of no case where any disturbance has been created by its formation.

Dental Excrescences are little nodules of secondary dentine formed upon the walls of the pulp chamber of the teeth which have been subject to no other apparent change or lesion.

They seldom give any pain, but sometimes are the cause of neuralgia. As the first form of secondary dentine never gives uneasiness, and the second seldom, we will pass them by and take up more minutely the third class, or Osteo-Dentine, which very often required the attention of the practitioner of dentistry.

"All the tissues appear to be calcified promiscuously; the vessels, or many of them, are the last affected, still they are early reduced in number, as those which occupy the axis of the dentine—Haversian systems—are far less numerous than those of the original pulp." (Salter, p. 69.) * * * "Osteo-dentine has fewer tubes than any other form of dentine, and is usually very transparent." (Salter, p. 70.)

The tubes in osteo-dentine are irregular in direction, which is easily accounted for by referring to the vessels and nerves in a normal pulp.

Calcification of the dental pulp is confined to no particular period of life. It is found in deciduous teeth, and in the permanent teeth of the young, the middle aged, and the aged. From observation, I should conclude that the deciduous teeth are oftener found in this condition than the permanent of any age.

As this condition of the pulp is a pathological one, we will look for the causes.

Irritation no doubt is the cause, and this may be produced in a number of ways, viz.: Caries, which removes a part of the tooth, and exposes the dentine to outside influences which act directly upon the pulp; recession of the gums and alveolar process; abrasion, chemical or mechanical; large metallic fillings and lack of occluding teeth. Tomes, p. 475, says: "In old age the pulp, to some extent, shrivels, and becomes the seat of various degenerative processes. Thus the arteries and veins become indistinguishable, and

their coats are kept rigid and distended by irregular calcareous depositions upon them." * * * "These same results may follow upon irritation of the pulp, even in young people."

What are the symptoms by which we may be enabled to diagnose this pathological condition of the dental pulp? The answer is obtained by careful study and close observation of cases. But first let us consult good authority. Tomes (p. 575,) in giving the causes of neuralgia, mentions secondary dentine in the pulp-cavity. Neuralgia is, therefore, one symptom: and he says, quoting Dr. Cayley, "It may be here mentioned that the attack, when it is dependent on diseased teeth, almost always comes on in the evening." He also says, "As a general rule, the pain due to osteo-dentine is of gradual development." * * "It is usual for pain due to partial calcification to be distinctly localized, so that the patient is enabled to point out the affected tooth." Sharp, lancinating pains, and sensitiveness to thermal changes, are other symptoms.

Neuralgia is one of the symptoms that has been accepted as belonging to calcification of the dental pulp, and, no doubt, the pain is caused by the nerves becoming irritated by the calcific deposits, or the entangling of the nerves among the nodules of osteo-dentine. In Tomes (p. 571) we find the following, which I will present as collateral evidence of this theory: "A remarkable form of neuralgia has recently been described by Dr. Gross, Professor of Surgery, as occuring in edentulous jaws, or in spaces from whence teeth have been removed. * * * The explanation of the pathology of the affection, offered by Professor Gross, is that the minute nerves, distributed through the wasted alveolar border, have undergone compression from the osseous matter in the canals, and some support is lent to this view by the fact that the bone was found to have a dense ivory like consistence, where cut down upon at the affected spots, and the overlying gum was dense and unusually adherent."

"In each case recorded, Professor Gross, after the failure of other remedies, resorted to the excision of the affected portion of the alveolus, which, in most cases, affected a permanent cure, and in all produced great alleviation of the symptoms." Also we may add an itching sensation, simulating that felt in the knitting of a broken bone. I will offer the following theory to account for the sharp sudden, lancinating pain felt in a calcified pulp. The symptom will be observed in a case where there has been a dull pain for some time, due to an inflamed condition of the remaining soft part of the pulp; the small blood vessel, the artery or capillary, has become so small, or hardened, that it is with difficulty the blood corpuscle, *or a clot*, can pass through, and it becomes lodged; but finally the *mass suddenly passes through*, and being forced upon the inflamed mass, causes this sharp pain. If the case is allowed to run its course, inflammation of the remaining portion of the pulp results in its death, and the decomposition will cause inflammation of the periosteum, which may result in an abcess, and this finally coming to the surface of the gum, gives vent to the pus, and relief to the patient.

Grouped together, the symptons are neuralgia, sensitiveness to thermal changes, "slight uneasiness at any time," lancinating pains and itching. In the last stages, pericementitis and its sequences.

The treatment, when there is no occluding tooth, and is not desirable, or practical, to insert one, as, for instance, a wisdom tooth, extract.

Should it be desirable to preserve the tooth, cut into the pulp chamber, devitalize, if alive, or remove the decomposed mass, if dead, treat in the usual manner. Insert occluding teeth, when caused by their lack.

CASES.

Miss ———, between twenty-five and thirty years of age, ame to have some teeth filled. Found the left inferior first molar with a large amalgam filling in crown surface, which had been inserted five or six years before. The tooth had

decayed on the distal surface until the pulp was almost exposed; filled with oxy-phosphate as a temporary filling, and had no further trouble. This was in August, 1880. Called again, April 11, 1881; complained of pain in teeth and face on left side, but could not locate in any particular tooth; found temporary filling in good condition. Complained of a feeling of pressure in the tooth under consideration. During the time between May, 26, 1881 and July 3, she called several times, and I had separated the tooth from the one in front and on distal surface, but still the feeling of pressure remained; and at one of the visits she said that the day before she felt a sudden, severe pain that was almost enough to make her faint. Proceeded to devitalize the pulp; but still the feeling of pressure remained. Made up my mind that it was a case of exostosis, and extracted, and found nodules of osteo-dentite in pulp, and roots largely exostosed. The patient had no further trouble.

In Salter (p. 137) is the following: "In one case, a little boy, eight years of age, was suffering extreme pain from an apparently sound temporary canine. Mr. White extracted the tooth and the pain ceased. In the pulp cavity was found a lobulated, calcified mass, filling nearly the whole cavity at the junction of its middle and lower thirds, and pressing the *fasciculi* of nerve fibres out of their course."

In 1875 I had a case of which I made a few notes at the time. The patient, a man, age twenty-eight; the tooth, a first superior molar, left side; had been filled six years before, with amalgam; filling had been out two years; tooth had ached slightly at times, since filling came out. In preparing to refill, the horn of the pulp was exposed. The tooth was medicated, and filled temporarily. In a week, during my absence, the tooth began to ache badly, After a week of suffering, the plug was removed, and the pulp found partially dead. After a few days the dead pulp was removed, and several nodules of calcified matter were

found. The pulp in buccal roots was soft and vascular, and that in the palatal, calcified.

In a discussion which followed, Dr. W. H. Eames said that there was an objection to using the term Osteo-Dentine as applied to this texture by Tomes, as Osteo-Dentine—bone and dentine commingled—was seldom found in human teeth, but quite frequently in those of some animals.

Dr. Harper thought that Tomes used Osteo-Dentine and Intrinsic Calcification synonymously, as this form of Secondary Dentine possessed, in its form, certain characteristics of bone, but not necessarily bone cells.—*Ohio State Journal of Dental Science.*

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## ARTICLE IV.

### *On The Causes and Treatment of Tartar.*

BY O. G. DUNCAN, ENGLAND.

]Read before the Students' Society of the Dental Hospital of London.]

Mr. President and gentleman, the subject I have chosen for my paper this evening is one concerning which I found great difficulty in gathering information, so you must please excuse its brevity and its defects. It is also one that I fear will not leave room for much discussion; but perhaps the few ideas I have brought will be of interest to the new members of this Society, and if so the time will not have been spent in vain.

The deposit called "salivary calculus," or, to use the usual term, "tartar," is a collection of the earthy phosphates and other salts of the saliva, with epithelial scales and various extraneous matters entangled amongst them, found adhering to the various teeth.

A calculus is formed as a distinct concretion in one of the salivary glands or ducts; as a rule, when this is the case, like a calculus in the urinary bladder, there is a nucleus, which may be any foreign body that finds its way into the interior of the structure or organ. The two that I

have seen were each about the size of a pea, and quite soft. This was because there was no resisting surface against which they could be formed, and because from the inconvenience to which they gave rise they were not left long enough to become hardened. One of them was taken from the duct of a sublingual gland, which it so blocked up as to occasion an enormous accumulation of saliva. If the calculus can be felt by the finger it can, of course, be removed by a pair of forceps, but if it is some distance within the duct, so that it can only be felt with a probe, an incision must be made in order to reach it.

The formation of a calculous deposit upon the teeth, in a greater or less degree, may be said to be almost universal; for although in persons of good health it is possible by care to remove it by brushing soon after it is deposited (so that the teeth are kept nearly free from it,) still it is always being produced, and would be present if care were not used. We have seen that its source is the saliva, which is the secretion of the several salivary glands mixed with that of the small mucous glands; it is thin and watery, and contains a small quantity of animal matter, which is secreted by the sublingual gland and is called ptyalin. Ptyalin has a very peculiar property, it does not act upon proteid matters, not upon fats, but if mixed with starch and kept at a moderate temperature it converts the starch into dextrose or grape sugar, which is easily soluble, and useful for nutriment, whilst starch *per se* is quite insoluble, and therefore innutritious. The other constituents of saliva besides the ptyalin are the phosphates of lime and magnesia, the chloride of potassium, chloride of sodium (or common salt,) the carbonates of lime and magnesia, a small trace of sulphocyanate of potassium, and water. As regards the sulphocyanate of potassium it requires no great analysis to distinguish it; all that is necessary is to add a drop of the tincture of sesquichloride of iron to some saliva in a test tube, when you see the characteristic blood-red tinge develop itself. Now, the salts are only thrown

down when the saliva is alkaline, as an acid reaction entirely prevents their precipitation. Thus we rarely see much, if any, around the upper incisors, because here the albuminous matter which is secreted from the mucous glands collects and ferments, and the resulting acidity serves to keep the salts in solution; whilst around the lower central incisors of the same patient we find them precipitated in abundance; this is because these teeth from their position are continually being bathed in alkaline saliva, so that no acidity can exist to keep them in solution.

Tartar collects in the largest quantity on the outer or buccal surface of the upper molars, just opposite the opening of Steno's duct—the duct leading from the parotid gland. This is more easily explained than in the case of the other situations where tartar collects, because the secretion from the parotid gland becomes turbid with crystals of carbonate of lime simply by exposure to the air, and this gland supplies more of the saliva than any other, as it is continually pouring out its secretion, whilst the sublingual and submaxillary glands only come into action at the thought of food or when required to act upon it when introduced into the mouth. The position also of the upper molars renders them less liable to friction, as they are protected by the cheek, whilst the deposit of tartar behind the lower incisors is greatly impeded by the continual action of the tongue.

Tartar exists in several varieties, which are named from variations in color and density. The usual color is whitish-yellow or buff, then we have the dark brown or black, and the green, but as far as I have tested them they do not differ chemically. The difference is due to the time occupied in deposition. If it is deposited quickly it will be of a light color and soft, whilst, on the contrary, if slowly it will be hard and dark. It is capable, also, of being stained by any coloring matter frequently taken into the mouth, as is the case of great tobacco smokers; or in patients who

while taking any of the preperations of iron, drink tea just before or directly after, in which case the tartar will be stained perfectly black. The green variety, as a rule, is due to pus, which is formed by the irritation and inflammation caused by the tartar itself.

The way in which tartar is produced and the source from which it is derived have been stated and explained in various ways, but there is no doubt that that which we have noticed is the true explanation. That it is produced from the saliva is thoroughly proved by the fact that by chemical analysis the saliva is found to hold in solution the very elements of which the substance we are considering is composed, and that it is found exactly opposite the opening of the various ducts in the largest quantities, becoming thinner and thinner the further it is formed away from them.

With the exception of caries and violence this deposit is the most destructive influence to which the teeth can be exposed, but the effect it produces upon the teeth is only indirect, acting through the gums and alveoli, which it so destroys as to deprive the teeth of their support. If we look at a tooth so lost we see that the tartar reaches to nearly the apex of the fang, and the edge of this tartar nearest to where the margin of the gum was is very rough and sharp. The gum being in contact with this sharp rough margin become irritated and inflamed, the alveoli are absorbed, and the gums recede. As this process continues, fresh salts are precipitated on the exposed surfaces of the teeth, for tartar seems to have a greater affinity for the dental tissues than for itself.

A temporary support is produced by a large quantity of tartar, which very often joins two or three of the loosened teeth together. When this is the case they come away conjoined when it becomes necessary to extract any one of them.

We have all noticed that though the lower central incisors are less attacked by caries than any other teeth, they

are the ones that are first lost by becoming loose, owing to this collection of tartar. Tartar used to be thought by some to be a preventive of caries. It was argued that where you see it in a large amount you see hardly any signs of caries, while, on the contrary, a person with a small amount of tartar, or perhaps none at all, is very susceptible to caries; this is due to the fact that tartar can only exist when the mouth is in a state unfavorable to caries, namely, in an alkaline condition.

As the accumulation of this substance affects not only the comfort and health of the mouth, but also the health of the whole system, the prevention of its deposition becomes of great importance, and there is no doubt that it may be obviated, or, at least, its immense accumulation lessened, by attending to the state of the stomach, and avoiding as much as possible any cause of irritation. But sometimes it is quite imposible to prevent its being deposited, as there are some people who are so susceptible to calculous deposits that no pains will stop its formation and it can only be kept down by constant attention, and by removing it while it is in a soft state. Very often when the tartar is of long duration the organic substances that are mixed with it decompose; this is the cause of the breath of these patients being so insufferable. Very often pus is seen oozing between the gums and teeth; this also makes the breath very offensive. If the patients rinse their mouths after each meal the collection of fats and other organic matter will be prevented, and thus, at any rate, they will keep their breath sweet. In advising patients as to the tooth brush after scaling, it is always best to tell them not to use one with hairs that are very stiff, as they are liable after the relief to scrub so hard, as if to make up for lost time, or so that it shall not occur again, that when you see them some time afterwards the necks of the teeth are very much worn away. I therefore tell them to have one with hairs not too closely set and very elastic, so as to remove the tartar, &c., from between the teeth.

I have found that most of the lotions which are sold to render "the teeth of pearly whiteness" contain dilnte mineral acids and perfume. They certainly do make the teeth white and remove the tartar, but it is only at the cost of the enamel prisms, and lastly of the teeth themselves. Sometimes, also, patients will say they find vinegar cleans the teeth; this, of course, is a vegetable acid, and has a similar action to that of the mineral acids, only in a minor degree. The proper method, of course, is to remove the tartar with instruments adapted for the purpose, called scalers, and shaped for removing it from the different situations. There is no necessity for having them so large as some of the instruments are made. The best sets are Lord's and Howe's. The former's sickle scalers, as they are called from their shape, are very useful for removing the tartar from between the teeth. The scaling instruments should be highly tempered, and the edges kept sharp and clean. For the operation to be of benefit it must be performed thoroughly both on the external and internal surfaces as well as between the teeth, as the smallest particle left below the proper line of the gums will form a nuclens for further deposits, and thus keep the gums from recovering their normal position.

If the calculous deposit be present in such large quantities as to have loosened the teeth it is best to remove it at intervals of a few days, first removing that which is nearest to the apex of the fang. This will allow the gum to be again restored, and give the teeth a little chance of becoming tight; it will thus also permit of the remainder being removed without so much danger of removing the teeth with it. The tightening of them will be greatly assisted by frequently applying to them during the interval such astringents as tannic acid, alum, &c. After the tartar has been thoroughly removed it is a very good plan to nicely polish the teeth with pumice on a piece of cane, or for those who use the dental engine, with the wooden points sold for the purpose.—*British Journal of Dental Science.*

## ARTICLE V.

### *How to Treat Alveolar Abscess.*

BY DR. L. D. CARPENTER, ATLANTA, GA.

The subject of alveolar abscess is one fraught with great interest to the dental profession. Much has been written on the subject. Yet as many are in the dark as to the best mode of treatment, I give you an item in my own practice.

Some twenty five years ago, in the youth of my professional life, I was very much troubled and annoyed, aye, vexed, with the stubbornness of alveolar abscess, connected with dead teeth, in which the nerve had, from the inroads of decay, or the close proximity of a metallic filling become devitalized, abscess formed with a fistulous opening through the labial surface of the gum.

My style of practice at that time was, (and I believe it was the adopted rule by the profession) to excavate or open up the nerve cavity, remove therefrom all *debris* and decayed particles as perfectly as possible to the apex of the fangs, cleanse the nerve cavity nicely with tepid water and alcohol, then wind a shread of cotton around a nerve broach, dip in creosote, press the broach into the nerve cavity, and pump the cresote if possible, through into the sack at the end of the tooth and thence along the track of the abscess to the external opening on labial surface, then pack the nerve cavity with cotton, the first little pellet having been moistened with creosote—dismiss the patient to return again in one or two days, when the same treatment was repeated as before and patient dismissed to return again in two or three days.

These frequent visits were made for weeks, and perhaps sometimes for months, before I could feel satisfied that the abscess was cured, and it was safe to fill the tooth.

During this interval twenty-five or thirty sittings have been given the patient and about forty-five minutes of val-

uable time given to each visit; the tooth is filled, nerve and crown cavity, nicely, with gold, occupying about three hours; a charge is made of the nominal sum of five dollars; the operator straightens up his, then almost broken back, wipes his dimmed eyes and has a feeling of satisfaction come over him that he has done his every duty faithfully for himself and his patient, and is now ready to receive the thanks of an appreciative patron. Whilst thus musing, a sound greets his ear, a "still small voice" is heard, and these words like peals of thunder come rolling up before him: "Doctor, your charge is *outrageous*! why, Dr. So-and-so treated a tooth for Mrs. Spilkins for one solid year, filled it with gold from top to bottom, and only charged her *one dollar!* and took his pay in chickens at fifty-cents apiece! You are an impostor, Sir!"—Exit.

Thus endeth the first lesson.

In 1862, after taking account of stock, I found on hand: One wife, a house full of children and five dollars in Confederate money, with the buttons off the boy's jacket and a spool of white cotton, then worth ten dollars—(Fiction.)

With this view of the situation, and the dear ones around me begging for buttons, thread and more chicken, I decided to change my base of operations, erect new fortifications, enlist a new army, and attack the aforesaid class of teeth from an entirely new stand-point.

From that day to this, (20 years,) I have treated all teeth as herein described, after this wise: Having prepared and cleansed the nerve cavity nicely as possible, I force creosote or carbolic acid through the nerve canal into the abscess at the end of tooth, until I can see it come out freely at the opening on the labial surface; then I know the sack is broken, and the entire track to the fistulous opening is submerged with creosote. I then roll a small piece of soft gold foil, No. 4, around the point of a delicate "nerve plugger," dip it in creosote or carbolic acid, and pass it along the nerve canal to the foramen at the apex of root; the gold slips from the plugger and is packed, by

gentle pressure, firmly to the walls and bottom of the cavity. Continue filling with gold until the nerve cavity is one-half or two-thirds full; then to prevent communication with the outside world, in the way of electricity, galvanism, or any other "ism," I fill the remainder of nerve cavity with any cement filling which will act as a non-conductor, and the remaining crown cavity I fill with gold. This is all done at the first or second sitting of the patient, with not more than one or two days intervening between appointments; and in a practice of twenty years, all teeth of this character, from the central incisor to the second bicuspid have been, in my hands, an almost universal success, without any regard to the time and alveolar abscess has been in existence.

In my opinion the sequel to this "whole business" is this; The nervous system is one vast circuit of telegraphic communication, with grand trunk and branch lines running in every direction. General distributing offices are established in various sections of the circuit, and branch offices at the end of every line, with the brain as the great home office or grand centre.

The nerve of a tooth is disturbed or interfered with, from some cause, and unable to perform its function; a dispatch is immediately sent to the nearest distributing office,. and from thence to the home office; a detachment of extra laborers is immediately sent out to repair the break. When they arrive on the ground, and view the situation, they find a sack at the end of the tooth, the poisonous contents of which are oozing out, and have already destroyed the "osseous" walls on one side and passed out at an opening on the labial surface. The workmen clear away the rubbish and commence as best they can to lay a new foundation; all are working nicely, songs are being sung, and the wall are going up slowly, but securely, when methinks a slight scratching sound is heard in the tooth beyond them; presently a rushing noise is heard in the distance as of a mighty tornado, and here comes, through the foraman at

the end of the root, alcohol, hot water, creosote, iodine, aconite, aromatic, sulphuric acid, salt and water, soap-suds, and all other kind of suds, into the face and eyes of these infinitesimal laborers, causing them to yell "calf, rope," and fall dack, blind and insensible, into what at that moment would appear to them, "hell on fire." Soon re covering however, they return, and find that the "sluice" has carried away with it a part of the wall just built; with renewed energy they commence work again, but are soon interrupted as before; in the meantime, however, they are gaining in their structure, and after months, perhaps, of toil and vexation they have accomplished their work, the abscess is crowed out, the fistulous track is obliterated, and the workmen pack their tools, after putting up the wires, return home and make a report of success. The Dentist has by this time filled the tooth, and announced to his patient, in all the "wisdom of Solomon." "I have done this; it is perfectly wonderful, madam, what a beneficial effect these remedies have had in your case."

What poor deluded, ungenerous mortals we are. If, on the first injection of creosote, the tooth had been filled, the cause of all outside trouble would have ended, and nature's forces could have, in a few days, repaired all damage.

I beg your pardon for this extended trespass on your valuable space, and hoping you all success, and that we may soon hear from "another county."—*Southern Dental Journal.*

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## ARTICLE VI.

### *Treatment of the Mouth During the Eruption of the Permanent Teeth.*

It is generally held to be good doctrine that the deciduous teeth should be retained in the mouth till their successors, the permanent ones, appear; and as thus abstractly recited, the doctrine is undoubtedly sound. The process of nature, when unhindred, needs only to be watched to learn so

much. The deciduous teeth erupt, attain their size, do their work, become loose, and fall out to give place to the firmer stronger ones that are to attend man through his chewing days. When these milk-teeth fall, instead of long roots which it was supposed they had, lo! there is seen only a ragged-edged base, and no root at all. Now, it is a fact that the deciduous teeth, in their fullest development, have proportionally longer roots than the permanent ones. Where are they? Absorbed. The pressure upon them of the growing permanent germs, causes absorption. Two results are thus attained. The obstacle, which is the deciduous root, is removed out of the way of its ambitious successors; and an irritation is kept up by means of this pressure, which facilitates the process of development,

Remove the milk tooth while yet its root is of full length, unpushed by its supplanter, and the eruption of the latter is checked, and often delayed for months. Why? The healthful excitement so greatly conducive to its growth is wanting. It is by antagonism we advance. In indolence we stagnate, if not retrograde. The principle runs through nature.

But this normal process may by some means be interrupted or prevented, and a corresponding departure from standard treatment be necessary to counteract the evils which such interruption or prevention would cause. In such a case our so-called "sound doctrine" would be very bad doctrine, and the effect of its application pernicious.

From some cause, to us unknown, the new tooth may be turned from its normal course, and when discovered may pain without or within the proper circle. If this state of things is not corrected, a wide departure from propriety will ensue. The erupting crown of any of the twelve front teeth, in shape a wedge with its base downwards (inwards,) presents its inclined surface to and impinges upon the inclined surface of the root occupying tooth, it also being in shape a wedge with its base upwards (outwards,) and the inevitable result is a growing displacement.

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Or the permanent six-year molar and permanent first bicuspid on either side of either jaw may develop to a full size while yet the temporary molar remains firm, and be so shaped and inclined as to overhang, before and behind, this shorter temporary molar, thus locking it in its position firmly. The new second bicuspid coming up to succeed it, makes its way in the track of the dissolving roots of the temporary molar till it reaches the gum margin, where it meets the obstructing wedged crown, which will neither dissolve nor dislodge, when it either remains undeveloped or shoots off in a wrong direceion, causing deformity and injury. This is a condition often overlooked. To correct it, the wedged crown of the temporary molar must at once be removed. Again, a careful examination of the mouth during the period of eruption of the permanent teeth may lead the wise dentist to the conclusion that the upper and lower dental arches, when sufficiently expanded to bear a symmetrical relation to the frame work of the other features, will not accommodate all the teeth which will naturally erupt therein; in other words, that if all the permanent teeth are allowed to take their places, the jaws will be so expanded as to cause disproportion in the features, —the mouth. He will see also, mentally, a crowed arch, teeth forced out of line, contacting surfaces decayed, and an endless need of the dentist's remedial services. This, it may be objected, is too much for a dentist to foresee. I think not. He is supposed to understand the normal development of the region he is educated to treat. He should know, when looking at the nose, cheek bones and chin, what sort of a mouth properly belongs to them. And having closely observed the processes of nature, he should be able to tell what is likely to be the extent of maxillary and alveolar development; how much space there is likely to be in a normally developed alveolar ridge. How, when the first permanent teeth appear, a fair judgement can be formed as to the size of the entire set, and the conclusion quite safely reached whether they will have sufficient room.

If it is concluded that they will not, then the future welfare of that mouth requires that certain teeth be sacrificed. The next question is, which shall they be? While allowing that varying circumstances may vary the decision of this question, I would say, as a rule, the six-year molars. "And why?" queries my sharp reviewer. I will state why. For several reasons:

1st. They are usually the least durable teeth in the mouth.

2d. If extracted before the second molars erupt, the teeth forward of them will naturally, fall back slightly, thus gaining relief from lateral pressure, and the second molars, as they develop, will come gradually forward into the places made vacant, closing up all spaces and making an unbroken masticating surface.

3d. Room being thus at the ends of the alveolar ridge, the *dentes sapientiæ* can erupt more easily, more regularly, less painfully, and in positions where there usefulness will be greatly increased.— *Missouri Dental Journal.*

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## ARTICLE VII.

### *Spontaneous (?) Abrasion of the Teeth.*

BY DR. S. H. KING, LINCOLN, NEB.

Every dentist of experience has frequently met with cases of dental disintegration commonly called "spontaneous abrasion." To show, upon etiological principles that no such abrasion exists is the object of this brief paper.

That the character of spontaniety should ever have been given to any disease and found a place as such in our text-books, is as surprising as it is fallacious. One might as well claim a result without a cause, as to imply that a tooth has, or can have in it, normally, the elements of self-destruction. The cases of disintegration alluded to, and which no doubt *you all have* met with in practice, to wit:

the denudation of the cervical portion of teeth of their enamel, and also the crumbling and apparent wearing away of the incising edges of the cuspids and incisors—all have a cause external and entirely foreign to the tooth itself.

First, Let us examine the structure of the enamel. The exterior, or enamel cuticle, is an apparently structureless mass, solid, hard and flinty—upon the perfection of this cuticle almost entirely depends the natural durability of the teeth. Immediately beneath this, lies the enamel proper, composed of hexagonal rods, of solid matter with a slight film or trace of animal matter surrounding each—these rods stand, as it were on end, or run approximately at right angles with the surface of the teeth but in segments, the rods of each section running paralled with each other and the V shaped interstices between the sections filled with similar rods of varying lengths. The chemical composition of the enamel is ninety-six and a half per cent. of earthy matter and three and a half per cent. of animal matter. The earthy is principally carbonate and phosphate of lime with traces of fluoride of calcium and phosphate of magnesia.

All these salts are soluble in even dilute acids the enamel cuticle having the strongest resistance to their action. Hence I have no hesitation in saying that in all cases of so-called "spontaneous abrasion" the cause may be traced to acidulous action.

A patient of mine whose teeth I had not seen for two years came to my office a few weeks since, anxious to know what could be done for his teeth. Other dentists had pronounced it a case of "spontaneous abrasion" and beyond cure. Upon examination I found the cervical portion of the incisors and bicuspids denuded of their enamel some of them to the extent of one half of the labial surface. My first remark was—"You eat lemons?" He said he did, and expressed surprise that that was the cause of the trouble.

During my visit in the east a few months since, while making a friendly call upon one of our profession, he ni-

vited my attention to a case then in his office of the abrasion of the incising edges of the six superior single rooted teeth, the disintegration having extended from one-fourth to one-half the distance to the gum, so that upon occlusion an opening of one-eight of an inch was visible between the superior and inferior incisiors.

Upon questioning the patient as to the cause, no satisfactory reason could be found until I inquired what his occupation was? He replied he was employed in a soda or pop factory, and attended principally to charging the soda fountains. The cause was no longer a mystery; the effect of acid fumes was at once settled upon as the solution of the problem and cause of the dissolution of the teeth. A further evidence of the correctness of this theory was that the contour of the abraded edges of the teeth corresponded exactly with the line of the lips protecting the remaining teeth, when the patient parted the lips to breathe through the mouth.

Some authors claim that a slightly acidulous condition is the normal condition of the mouth; this certainly must be an error, for nature would never make such a mistake as to construct useful members like the teeth and at the same time surround them with a merciless destroyer like an acidulous saliva.

I believe the precise normal condition to be neutral. In the many mouths which I have tested, the acidulous were always those in which were found marked modifications of present progressing caries of the dental organs; so that I arrived at the conclusion that a slightly alkaline condition is to be preferred where the golden means of neutrality cannot be maintained. The greatest deficiency in the dental profession seems to be in the direction of etiolgy. In the art of restoration of the lost, and preservation of the decaying, we are far advanced, but how few of us stop to study the cause and intercept it with prevention which is superior to cure.—*Proceedings of the Nebraska Dental Society.*

## *Texas State Dental Association.*

On Tuesday and Wednesday 2nd and 3rd of May, delegates to the State Dental Association arrived in Waco, on each train and were met by friends who conducted them to the hotels or their homes. At 3 P. M., May, 3rd, the body met in the parlors of the McClelland Hotel, and was called to order by the President, Dr. W. S. Carruthers of Galveston. The following members were found to be present:

Dr. W. S. Carruthers, president, Galveston; J. L. Fountain, Bryan; S. E. Jones, Houston; W. R. Clifton, Waco; J. B. Chess, secretary and treasurer, San Antonio; G. P. Mann, Waco; W. H. Cain, Calvert; H. C. Mosley, Corsicana; G. M. Patten, Belton; Wm. Stiles, Austin; J. H. Grant, Austin; G. S, Staples, Sherman.

After calling the roll the president read an appropriate address.

The following named dentists were offered and elected active members of the association:

Drs. F. H. Lipscomb, Waco; L. J. Goree, Navasota; J. M. Cain, Waco; E. B. Stiles, Austin; R. E. Eakin, Fort Worth; A. A. Beville, Waco.

Honorary Members—Drs. Ashbel Smith, Harris County; T. O. Wooten, Austin.

Associate Members—Matt L. Pyron, San Antonio

The balance of the afternoon was spent in attending to the general business of the association. Adjourned at 5:30 until 7:30

### EVENING SESSION.

Meeting called to order at 7:45, 18 members being in attendance and as the order of the evening was essays, the first call was for essay on "Dental Education." Dr. J. H. Grant read an exhaustive essay on the subject and received a vote of thanks, after which a general discussion was participated in by the members.

On motion, adjourned until 9 A. M. Thursday.

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The second day's session of the Texas State Dental association having convened in the spacious parlor of the McClelland Hotel,

was called to order by the president, W. S. Carruthers, at 9:30 yesterday morning. Nineteen members present.

The first business in order was the report of the committee on legislation. The committee called attention to the laws on the subject of dentistry framed by the States of Alabama and Illinois, and recommended the selection from these laws such parts as seemed best suited to meet the needs of the profession in this State. The corresponding secretary was directed to prepare a memorial in accordance with the report, for presentation to the legislature, and Drs. Stoddard, Carruthers and Patton, were appointed a committee to assist him. The most important features of the memorial is a law to protect the public against quack dentists. This was recognized by all as of great importance and elicited general discussion,

Shortly before 1 P. M., the convention adjourned to met again at 2 o'clock, and by an invitation from Dr. Clifton all repaired to the McClelland House dining hall, where a sumptuous dinner was served. After fully discussing the substantials and delicacies, so bountifully spread, the table was cleared and the sparkling bowl went round, and was again refilled until members waxed eloquent, and toasts were drank to the prosperity of the association, to the officers, to the lady members who were absent but never forgotten, and then, "with empty glasses to the press" —no, this was tabled, or rather the glasses were, and filled to the brim, and hearty esteem quaffed to "the press." We appreciate the good spirit in which it was done, and doft our hats to the association, and wish it such prosperity as will make it the pride of the profession.

AFTERNOON.

Election of officers took place at once; which resulted in the election of the following members as officers for the ensuing year: W. R. Clifton, Waco, president; R. E. Eakin, Fort Worth, first vice-president; J. L. Fountain, Bryan, second vice president; J. B. Chess, San Antonio, recording secretary and treasurer; J. H. Grant, Austin, corresponding secretary.

Executive Committee.—William Stiles, Austin; W. S. Carruthers, Galveston; G. S. Staples, Sherman.

On motion, it was ordered that the next meeting should be held in the city of Dallas, commencing on the first Tuesday in

the end of the root, alcohol, hot water, creosote, iodine, aconite, aromatic, sulphuric acid, salt and water, soap-suds, and all other kind of suds, into the face and eyes of these infinitesimal laborers, causing them to yell "calf, rope," and fall dack, blind and insensible, into what at that moment would appear to them, "hell on fire." Soon re covering however, they return, and find that the "sluice" has carried away with it a part of the wall just built; with renewed energy they commence work again, but are soon interrupted as before; in the meantime, however, they are gaining in their structure, and after months, perhaps, of toil and vexation they have accomplished their work, the abscess is crowed out, the fistulous track is obliterated, and the workmen pack their tools, after putting up the wires, return home and make a report of success. The Dentist has by this time filled the tooth, and announced to his patient, in all the "wisdom of Solomon." "I have done this; it is perfectly wonderful, madam, what a beneficial effect these remedies have had in your case."

What poor deluded, ungenerous mortals we are. If, on the first injection of creosote, the tooth had been filled, the cause of all outside trouble would have ended, and nature's forces could have, in a few days, repaired all damage.

I beg your pardon for this extended trespass on your valuable space, and hoping you all success, and that we may soon hear from "another county."—*Southern Dental Journal.*

## ARTICLE VI.

### *Treatment of the Mouth During the Eruption of the Permanent Teeth.*

It is generally held to be good doctrine that the deciduous teeth should be retained in the mouth till their successors, the permanent ones, appear; and as thus abstractly recited, the doctrine is undoubtedly sound. The process of nature, when unhindred, needs only to be watched to learn so

much. The deciduous teeth erupt, attain their size, do their work, become loose, and fall out to give place to the firmer stronger ones that are to attend man through his chewing days. When these milk-teeth fall, instead of long roots which it was supposed they had, lo! there is seen only a ragged-edged base, and no root at all. Now, it is a fact that the deciduous teeth, in their fullest development, have proportionally longer roots than the permanent ones. Where are they? Absorbed. The pressure upon them of the growing permanent germs, causes absorption. Two results are thus attained. The obstacle, which is the deciduous root, is removed out of the way of its ambitious successors; and an irritation is kept up by means of this pressure, which facilitates the process of development,

Remove the milk tooth while yet its root is of full length, unpushed by its supplanter, and the eruption of the latter is checked, and often delayed for months. Why? The healthful excitement so greatly conducive to its growth is wanting. It is by antagonism we advance. In indolence we stagnate, if not retrograde. The principle runs through nature.

But this normal process may by some means be interrupted or prevented, and a corresponding departure from standard treatment be necessary to counteract the evils which such interruption or prevention would cause. In such a case our so-called "sound doctrine" would be very bad doctrine, and the effect of its application pernicious.

From some cause, to us unknown, the new tooth may be turned from its normal course, and when discovered may pain without or within the proper circle. If this state of things is not corrected, a wide departure from propriety will ensue. The erupting crown of any of the twelve front teeth, in shape a wedge with its base downwards (inwards,) presents its inclined surface to and impinges upon the inclined surface of the root occupying tooth, it also being in shape a wedge with its base upwards (outwards,) and the inevitable result is a growing displacement.

occupied the same position in the old Baltimore College for eight years. Prof. Ferdinand J. S. Gorgas is the Dean of the Dental Department of the University, his address being the same as for many years past, 259 N. Eutaw Street.

A new building is now being erected for the Dental Infirmary and Laboratory which will not only be one of the largest, but the best lighted and equipped in the world. There will be in the Infirmary twenty-five large windows on *every* side, and its position running East and West, will make it one of the most comfortable as well as the most convenient of structures for such purposes. The Infirmary will extend over the entire second story and the Laboratory will occupy the first story, and both be equipped with entirely new and the most recent appliances. This new building will be completed and occupied by the first of August next.

The large building known as Practice Hall will be used as a Dental Lecture Hall, above which is the large and interesting Museum of the University.

The Summer Session commenced on the 15th of the present month, May, and is held in the large Dispensary Hall of the University Hospital Building Twenty-four thousand patients visited this large Hospital during the past year, which institution will furnish all the dental material desired for Infirmary Patients. Students attending the Summer Session have the privilege of attending the daily Surgical and Medical Clinics of the University.

Besides this Hospital, there are a number of Charitable Institutions in charge of the Faculty of the University, which will also furnish a large number of patients for the Students of the dental department. The lectures on Oral Surgery and the Oral Surgery Clinics will prove of inestimable value to the dental students, who have the privilege of attending all the general surgical clinics of the different Professors of the Medical Department. The instruction in both operative and mechanical dentistry will be as thorough as is possible, and the Dental Laboratory will be so equipped and arranged as to make it superior to any private laboratory.

The regular session will begin October 2nd, 1882, and continue until the latter part of February or 1st, of March, ensuing.

The fee sand terms are the same as at other Dental Colleges with the advantage of graduation in medicine at the end of one year after graduation in dentistry. Beneficiary Students are received from every State Dental Society at half fees, and no fees are charged for the Summer Session.

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*Life Insurance.*—Several years ago the writer had occasion to read a paper before the Virginia State Dental Association on the above subject, the object being to stimulate the formation of a mutual association for the insurance of the lives of dentists. Nothing come of it however, as it seemed difficult to obtain any concert of action among the profession. Still, we think that the difficulties are not insuperable, and there is no reason why the dental profession of Virginia or any other State should not have an organization like that adopted by some of the clerical bodies of that State—a system by which a bereaved family is guaranteed a comfortable sum in case of the death of its head. Lately there has been organized in Staunton, Virginia, the Valley Mutual Life Association of Virginia, which has adopted some features somewhat new in this country in life insurance, though well known and long practised in England, features which cannot fail to be popular, because they are so eminently just. And we advise those of our professional bretheren who contemplate insuring their lives to examine the methods of this company. This is written without solicitation, or knowledge on the part of those managing this company, and simply because we feel that it presents advatages not given elsewhere. As a rule dentists, though handling money freely seldom lay up much, and it is easy for them to pay out, from time to time the small sum necessary to keep up a policy which, in the event of death would keep wife and children from poverty.

J. B. HODGKIN.

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*Faculty Changes.*—As seen elsewhere two vacancies in the Faculty of the Baltimore College of Dental Surgery have been created by resignation. Prof. F. J. S. Gorgas, for many years the Dean of that college, has accepted the position of Dean of

the newly created Dental Department of the University of Maryland. Dr. James H. Harris, Professor of Clincal Dentistry goes also to that School with Prof. Gorgas.

The vacancy in the old college created by the resignation of Prof. Gorgas, so far as relates to the office of Dean, has been filled by the election of Dr. Richard B. Winder, to that position. Dr. M. Whilldin Foster, is elected Prof. of Dental Pathology and Therapeutics, and Dr. J. E. Lindsay, Prof. of Chemistry. Dr. J. Emory Scott, is elected Demonstrator of Mechanical Dentistry, vice Dr. J. C. Uhler resigned.

All letters intended for the Baltimore College of Dental Surgery, will be addressed to Dr. Richard B. Winder, 140 Park Avenue, Baltimore, Md.

J. B. Hodgkin.

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*Southern Dental Association.*—The approaching meeting of the Southern Dental Association, which convenes in Baltimore early in August next, should be borne in mind by all who are kindly disposed to that association. Full arrangements are being made to secure a large corps of clinical operators, culled from the ranks of the most gifted and experienced in the profession and covering not only Operative but Surgical and Mechanical Dentistry. It is proposed to make this *the distinguishing feature* of the meeting. The sessions of the Association will be held in the rooms of the Baltimore College of Dental Surgery, the ample Infirmary and Laboratory of which will furnish rare facilities for seeing as well as performing the operations &c., conducted. Further notice of the meeting and its details will be published hereafter.

J. B. Hodgkin.

# MONTHLY SUMMARY.

*Anatomical Anomalies.*—Dr. J. G. Wiltshire, of Baltimore, mentions, in the *Maryland Medical Journal*, the occurrence, in a colored subject of fine physique, of a peculiar series of anomalies in the position of the heart and the arrangement of some of the arteries. The heart was found on the right side, with its base at the proper level, corresponding with the upper borders of the third costal cartilages, with its apex pointing to the right, resting on the diaphragm at a space between the fifth and sixth ribs. It was normal in size and appearance, and had apparently taken this position in its cavity without any agent to determine the misplacement.

From the left side of the heart the arch of the aorta came off, and in every way behaved as it ought to have done, save in giving off its branches. The arteria innominata was wanting, its branches coming off from the arch in the following order:

The right common carotid arose from the upper face of the tranverse part of the arch, where it begins to descend toward the third dorsal vertebra, and then it ascended, in front of the trachea, to the right side of the neck, to its usual point of bifurcation into the external and internal carotids; the former gave off no branches until it reached a point opposite the symphsis of the chin, where a short axis was thrown off, from which the facial, lingual and superior thyroid arteries arose. The latter (internal carotid) presented nothing that was at all irregular in its behavior.

The left common carotid artery was derived from the outer face of the descending part of the arch and ascended, upon its old bed, to its usual point of bifurcation, acting as did its fellow on the opposite side.

The left subclavian arose from the decending part of the arch of the aorta, at a point where it crosses. and passed upward and outward to its usual line of passage to the anterior border of the first rib.

Nothing more occurred to the arterial tree to interest us, until it passed into the abdomen, where the cœliac axis came off from the posterior face of the aorta, and passed to the right of the latter to its front, where the hepatic, gastric and splenic arteries were given off. There were two renal arteries on the right side, whereas there was only one on the left.—*Medical and Surgical Reporter*.

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*Large Odontome Removed from the Lower Jaw.*—At a recent meeting of the Pathological Society, Mr. Christopher Heath read notes of a case in which he had removed a large odontome from the lower jaw. This was one of the rare tumors described by Broca as "odontomes odontoplastiques," and consisted of a mass of dentine studded with nodules of enamel. The mass weighed 315 grs., and measured 1½ in. by 1¼ in. The patient was a young lady of eighteen, who had never been able to close her teeth properly, but otherwise was supposed to have gone through the first and second dentitions naturally. Last Christmas she had pain and uneasiness about the right angle of the lower jaw; and in April her father, a dental surgeon, extracted the second bicuspid tooth, there being no molars then present. A dentist, who was frequently consulted, thought he detected an encysted tooth, and tried to extract it with the elevator. The result was an acute attack of periostitis. Profuse suppuration ensued, and on firm pressure near the angle pus could be forced up from the interior of the bone. Under treatment the inflammation subsided, and the patient went to the seaside, and on her return there was apparently some exposed bone, with greatly hypertrophied mucous membrane on each side. A month later, after imprudent bathing, sudden increase of pain and swelling took place, and she consulted Mr. Heath, who found great enlargement of the bone, with a fungus-like growth in the mouth, and apparently bare bone, the appearances closely resembling those ordinarily found in a case of sarcoma of the jaw. An operation involving removal of a portion of the jaw was declined, and the swelling slowly diminished again. In September Mr. Heath undertook an operation for removal of the supposed sequestrum of bone, and after considerable trouble succeeded in elevating the mass described from its bed, since which the jaw has slowly contracted to its proper stage.—*London Lancet.*

*A New Cure for Alveolar Abscess.*—The perfect application of any medicament to all parts of a large and inaccessible abscess always presented considerably mechanical difficulties, and it has occurred to me that, for the hydraulic or pneumatic pressures which are usually applied, there might be substituted some rapid chemical evolution within the cavity. I carried out this idea of injecting into a large abscess in my own mouth which had resisted all the ordinary applications of carbolic acid, creosote, and every other known remedy, as strong a solution as I could obtain of peroxide of hydrogen. This, if cold and rapidly injected, almost immediately afforded a rapid evolution of oxygen upon the whole surface of the abscess, and a more satisfactory antiseptic than nascent oxygen could scarcely be conceived. The liquid when injected was perfectly clear, but the operation was immediately followed by an enlargement of the cavity and the exudation of a white milky froth. The result was extremely satisfactory, a single injection of the peroxide effecting a complete cure.—*Dr. Walter Coffin.*

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*Communicability of Syphilis by Suckling.*—In the *Giornael Italiano di Soresina* (1880, p. 15,) Professor Scarenzio relates a case, which, if free from error in observation; is of much importance. A healthy young woman, aged 19, married, in December, 1874, a vigorous young man, lately returned from his regiment. In September, 1875, she gave birth to a weakly infant, which developed symptoms characteristic of inherited syphilis. When seven months old, its lips became the seat of erosions and ulcerations at the commissures. At the same time the mother, who had exclusively suckled the child, saw a chancre, accompanied with enlarged glands, develop on the right nipple, shortly followed by a characteristic syphilitic eruption. She gave birth to another syphilitic child in July, 1877. The author infers, from this case, that a woman may bear a syphilitic child to a syphilitic father, and remain herself uninfected; and, furtner, that it is imprudent to cause a syphilitic infant to be nursed by its mother, unless the latter should previously have exhibited symptoms of syphilis.—*Medical and Surgical Reporter.*

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*Death from Carbolic Acid.*—Rev. James Cameron, of Oakland, lost his life through swallowing a draught containing carbolic

acid. The mixture was designed for external application and the bottle containing it stood by a larger bottle containing a tonic which it was the intention to give him. He took the poisonous dose from a wine glass, and after swallowing half of it remarked that it was very strong, and then drank the remainder. There is something curious in the published account, which states that the mistake was discovered immediately, and an attempt made to give an emetic, but that he could not swallow; that the attendants forced down as much magnesia and oil as they could, but he "died in a few minutes." How a small draught so dilute as to admit of his voluntarily swallowing the second portion after tasting the first, could have produced death in so short a time is not comprehensible.—*Pacific Medical and Surgical Journal.*

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*Dentistry as a Specialty.*—At a recent banquet of the Chicago Dental Society some interesting remarks concerning the present and future of dental surgery were tendered W. W. Allport, M. D., D D. S. After alluding to the early efforts of Dr. Harris and others to establish a chair of oral surgery in some of our medical colleges, and the final establishment of our first dental college in Baltimore, the speaker called atttention to the present facilities for dental education in this country. Dr. Allport holds that a general medical education is as necessary as a foundation in dentistry as in ophthalmology, gynecology, or any other department of operative medical science, and thinks that at no distant day such a foundation will be required; and in this we heartily agree with him.—*Medical Record.*

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*Chloralated Tincture of Iodine.*—An Italian physician employs as a substitute for the ordinary tincture of iodine, to inject into the cavities of the body and in goitre and other tumors, a formula composed of two parts of pure iodine, three parts of chloral hydrate, and fourteen parts of alcohol strength thirty-six. Mix and filter. "The liquid is of a pure golden hue and has an odor and taste which indicate its ingredients." The chloral is dissolved in the solution without any decomposition. The solution is highly commended as a hemostatic and as an antiseptic and hypnotic in large wounds.—*Pacific Medical and Surgical Journal.*

# THE AMERICAN JOURNAL OF DENTAL SCIENCE.

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## ARTICLE I.

*Treatment of the Teeth with Dead or Dying Pulps; also Treatment of Alveolar Abscess.*

BY DR. H. H. TOWNSEND, OF PONTIAC.

[Read before the Illinois State Dental Society]

The great number of teeth that are now restored to comfort and usefulness, after disease or death of the pulp, or the pericementum has become inflamed or abscessed, which, but a few years ago were lost, with little or no effort being made for their preservation, is certainly very gratifying evidence of progress in this direction. That there are still some obstinate and intractable cases which despite the most patient and persistent treatment, have thus far proven incurable, while not so gratifying, is evidence that something yet remains to be accomplished. That the success attained by the majority of the profession in the treatment of alveolar abscess is largely due to the essays and discussions of the dental societies, I think will be admitted, and it is with the *hope* that by again debating this question, and comparing ideas and experiences, some new light may be afforded us, and some means and methods suggested which will enable us to treat successfully some of the now incura-

ble cases, that I consented to write upon this subject. An abscess is said to be a collection of pus in a circumscribed cavity. Alveolus is defined as a socket. Hence a collection of pus in the socket of a tooth is an alveolar abscess.

The first symptoms of this affection are a slight uneasiness in the tooth, and occasional slight pain, and a little tenderness felt upon pressure. As the disease progresses, the severity of the symptoms increases to an acute pain, elongation and looseness of the tooth, which is so sore that the slightest pressure is unbearable. The gum over the affected tooth becomes swollen, dark red, and very painful. When pus has pierced the bone, fluctuation is easily felt by pressing upon the gum with the finger. In some cases there is considerable constitutional disturbance. The tongue is thickly coated; breath quite offensive; skin hot and dry; pulse full and bounding; bowels constipated; and in short a real inflammatory fever is developed; the formation of pus being announced by a distinct chill. It is interesting to note the great difference in the severity of the symptoms in different cases during the formation of abscesses; frequently a slight soreness and occasional pain being all that is noticed by the patient until pus is discharged through the gum.

The principal causes of this disease are dead or dying pulps confined within the pulp chambers of the teeth; dead, or partially dead roots, which nature is making an effort to expel; and mechanical injuries. To which should be added as occasional causes: the imperfect removal of pulps; imperfectly filled canals; filling the apical portions of canals with cotton; and small canals left untouched. The severity of the disease is modified by the diathesis and health of the patients.

Pathologically, an alveolar abscess is quite similar to a whitlow or felon upon the finger, the difference is principally that of location, both being an inflammation and suppuration of a periosteal tissue.

A brief allusion to the pathology of inflammation may not be out of place, inasmuch as a knowledge of these phe-

nomena is necessary to intelligent treatment. It will be remembered that when an irritant is applied to a healthy tissue, a contraction of the blood vessels first takes place, followed by a corresponding dilatation—an increased flow of blood to the part; an adhering of the red blood corpuscles to the walls of the vessels, and also to each other until they become impacted, and the congestion results in complete stagnation—the dilatation being due to muscular exhaustion of the contractile coats of the vessels. If by any means this congestion can be relieved, the accumulated corpuscles sent off into the current, some stimulant afforded the exhausted coats of the vessels, and the circulation re-established—pus will not form, and the inflammation terminates in resolution. If, however, the congestion goes on to complete stagnation, suppuration must take place, and an abscess is the result. The length of time that an inflammation may exist, before terminating either by resolution or suppuration, varies as greatly as does the severity of the symptoms in different cases. Sometimes an abscess is formed only after weeks of inflammation, and again but few hours are required for the formation of pus.

The source of pus, the precise manner of its formation, of what it is composed, and in what respect it differs from the white blood corpuscles, are questions not yet definitely settled. Practically, with regard to the treatment of alveolar abscess, these are questions which concern us less than that of the *absorption of pus.*

Hamilton's Surgery, page 38, says upon this point that, "It is now pretty generally admitted that pus corpuscles, as such, are never absorbed; but that, after undergoing certain changes presently to be described, all the elements composing pus may return to the circulation; yet examples of the spontaneous disappearance of purulent collections, by disintegration and absorption, are certainly very rare. Its absorption is effected in the following manner: First, the serum and salts constituting the most fluid parts are removed; second, the pus corpuscles undergo fatty degen-

eration and disintegration ; finally, the pus corpuscles, thus metamorphosed and liquidified, are absorbed, also. In other cases, the serum alone is absorbed, and the salts, with the desiccated pus corpuscles, remain. The pus corpuscles, when thus separated from the serum, dried and aggregated, forming a cheesy mass resembling very much tubercular deposits; the salts when not absorbed remaining as cretaceous layers or nodules."

The treatment of alveolar abscess will depend upon the cause, and the condition in which we find it. If occasioned by a dead root, which nature is trying to expel, the extraction of the root will usually be all the treatment required. If from a blow upon the tooth, or other mechanical injuries, the pulp is still alive, and suppuration has not taken place, the inflammation may be arrested by preventing occlusion with the antagonizing tooth, and the frequent application to the gum around the affected tooth of the tinctures of aconite and iodine, two parts of the former to one of the latter. If pus has already formed, and the pulp still retains its vitality, every effort should be made to arrest the progress of the disease, as the pulp cannot long remain in a state of health if suppuration is allowed to go on ; particularly if the sac is near the apex of the root. Here we have a case analagous to the whitlow or felon referred to : suppuration of a periosteal membrane, where the cause is removed. A felon freely opened as soon as pus is formed, usually requires little or no other treatment. The same is true of an abscessed tooth caused by mechanical injury, where the pulp is not diseased. It is rather heroic practice to cut through the gum and alveolus, but I think it is justifiable in such cases. I should, in addition to the opening, paint the gum with aconite and iodine, as there is always some congestion surrounding the suppurating tissue. Where an abscess is caused by a dead or dying pulp, we must first remove the cause. It frequently happens, however, that owing to the extreme soreness of the tooth, and the nervous condition of the patient, it is impossible to do

more at the first sitting that to open the pulp chamber and afford vent to the pent-up gases, deferring extirpation and cleansing the root canals until the soreness subsides, which it usually does in a few days, especially if the aconite and iodine is applied to the gums. If the pulp is still too sensitive to admit of extirpation, I should devitalize it with arsenic, using for the purpose not more than 1-250 part of a grain, combined with from 1-32 to 1-16 of a grain of morphia with sufficient creosote to moisten the pellet of cotton, covering in all cases with a temporary filling of gutta percha. It is important that the surplus creosote should be absorbed before introducing the temporary filling, as otherwise it might be forced out, carrying with it some of the arsenic. Accidents have been caused in this way. The length of time which arsenic should be allowed to remain in a tooth varies in different cases. I think, however, it may safely be left until the pulp is entirely devitalized; this varying from a few hours to several weeks. As the last portions of the pulp die, some soreness is usually felt, which generally disappears in a day or two. No further irritation is experienced until mephitic gases are formed, when extirpation should be no longer delayed. Perhaps the best time for the removal of the pulp is when it is entirely dead and sloughing has taken place, as it then produces no irritation, is painless, and more easily accomplished than at any other time. I know of no way of determining just when this has taken place, except by testing. Usually, I think it occurs soon after the soreness subsides, occasioned by death of the apicial portions of the pulp. I certainly would not advise the removal of a pulp when only partially devitalized, as it is a very painful operation to the patient, and is liable to produce inflammation of the tissues beyond the foramen, which is often very difficult to control.

It is not difficult to say that the pulps should be entirely removed, the canals thoroughly cleansed and perfectly filled; but to state just how this is to be accomplished is

not so easy—will say, however, that for the successful removal of the pulp three things, at least, I regard as highly essential, viz.: The rubber dam, good light, and very delicate instruments, either entirely soft, or with an excellent spring temper. I wonder that any one should attempt the extirpation of a dental pulp, at the present day, without the aid of the rubber dam; yet I know it is the common practice of many operators. It is true that in a dry mouth the anterior teeth of the upper jaw can be kept tolerably dry with a napkin; but, all things considered, I doubt if as successful operations can be performed in any case without the rubber as with it. In the first place, then, I always apply the rubber dam, and open the cavity sufficiently to thoroughly excavate the decayed dentine; also, open the pulp chamber, so that every part of it can be distinctly seen with the aid of a mirror. Then, with a a warm air cavity drier, reduce the cavity to as nearly absolute dryness as possible; this bleaches the dentine, affording a much better light in the cavity. I then place my patient in the best light practicable; and here let me say that I think the want of good light is *one* cause, at least, of many failures in removing pulps and treating roots, as well as in many other dental operations. We *must* have light to see what we are doing. At first I operated by a north window, but in cloudy weather my light was not satisfactory; next, tried a west—this, in dark days, was good only in the afternoon; I then tried a south, which I liked much better than either of the others. For the past five years have operated by a south and west. Each window is supplied with two curtains, a green and a white, the former so arranged that they can be lowered from the top, or raised from the bottom, and the light admitted from the top or bottom, or both at the same time, if desired. The white curtains raise and lower in the ordinary manner. This affords the best light I have ever had, and enables me to see into pulp cavities, and find root canals with greater ease than any of the former arrangements. Especially is

this the case in operations upon the lower teeth. By shading the lower half of the window, the light admitted from the top only can be reflected into the pulp cavities with a concave mirror, enabling one to see distinctly where it would be impossible with the light admitted at the lower half of the window. Perhaps the best instruments yet placed in the market for removing the pulp of the teeth are the broaches with a single hook at the point. The temper of the steel bristles is certainly excellent, but have never found any with a point well adapted to the purpose. The barbed broaches are only useful in large straight canals. They lack toughness of temper, the barbs are too long, and too far from the point. They can be improved by cutting off the points at the first barb, filing down to a small size. leaving only two barbs nearest the point, and these very short. I think if the steel bristles had two or three very short barbs near the point they would be superior to any instruments yet devised for pulp extirpation. Great care is necessary in these operations to avoid the danger of forcing any of the pulp debris, or the point of the instrument, or both through the apicial foramen. These nerve bristles referred to should be used very cautiously, as their small size, smooth round surface, and excellent spring temper, render them well adapted to follow small curved canals, and they pass through the foramina so easily in many cases the membrane is wounded before we are aware of it. If any one doubts this, let him take a recently extracted tooth, and try the experiments, and he will find that in many of the buccal roots of the upper molars, even, these instruments will readily pass through the foramina half an inch or more. How much more easily, then, will they pass through the palatine roots of the same teeth, and also the large straight canals of the incisors and cuspids. As accidents of this kind always produce more or less irritation, and as prevention is better than cure, it is well to explore root canals carefully. In many cases considerable advantage is gained by reaming

out the canals, especially where the pulps can be removed only in fragments. A reamer will scrape off the particles adhering to the walls of the canals, which a broach or hook will not do. Glidden's reamers, while not all that could be desired, are very useful instruments, and have aided me many times . The reamers recently devised by Dr. Talbot are also very valuable, and although I have not been able to accomplish with them all that the inventor claims they will do, yet would not like to be without them. The canals in the incisors, cuspids, and bicuspids, are not usually difficult to cleanse or fill. Neither are those in the palatine roots of the superior, and the distal roots of the inferior molars. The buccal roots of the upper molars being smaller, and usually somewhat flattened and curved, are often difficult to treat, and sometimes even to find. The mesial roots of the lower molars are also flattened, and the canals usually more or less contracted, resembling an hour glass in shape—this contraction frequently resulting in two distinct canals. When this is the case considerable difficulty is experienced in following them their entire length, and perhaps in some cases it is impossible to do so. The right and left exploring instruments, with long, fine points, are valuable for finding these small canals. Frequently the canals in the buccal roots of the upper molars, are contracted near the pulp chamber, and if they are reamed out at this point, can be easily followed their entire length. For this purpose a three-sided broach, with rather a soft spring temper and a small round point, is often sufficient. Any reamer for this location must be short enough to allow its entire length between the open jaws, that the instruments may be used in the direction of the canals. Glidden's reamers may also be used in the same way by cutting off to the desired length and molding some sealing wax or modeling compound around the shaft for a handle. The canals should be thoroughly syringed with warm salt water after the pulps are removed. This is best done with the rubber dam still in position. After drying the cavities

with spunk, I use fine tissue paper cut in triangular pieces and rolled into fine points for drying the canals, principally. These are easily used in all except the small contracted canals. The process is completed with the warm air cavity drier.

I do not usually fill the roots at the same sitting that the pulps are removed. Consider it safer practice to wait a few days, as some irritation may result from severing the pulp vessels, or some pulp debris may have been forced through the foramen. Prefer, therefore, to leave some cotton in the roots, moistened with carbolic acid or creosote, to render it antiseptic, and fill temporarily with gutta percha. Neither do I regard it good practice to leave a cavity open after extirpating the pulp, as the food and fluids of the mouth soon find their way into the canals, where they decompose, often causing pericementitis, and in any case making it necessary to do the work of cleansing all over again. For temporary fillings I use the common red gutta-percha, with the addition of pumice stone to render it sufficiently hard and brittle to manipulate easily. It is much less expensive than the gutta-percha and answers the ordinary requirements of a temporary filling. I fill roots with the white gutta-percha, rolled out to the desired size with a warm knife. It is often necessary to cut off the extreme points to prevent carying it through the foramen. For the small tortuous canals I use a solution of white gutta-percha in chloroform. This, I find by experiments out of the mouth, can be carried with a fine bristle into surprisingly small canals. For some years I used this solution quite extensively, but the time required for hardening, the shrinkage, and the ease with which it is carried through the foramina in ordinary canals, are objections which do not exist in the use of solid gutta-percha. Considerable difference of opinion exists as to the necessity of filling these small canals at all—my own opinion being that it is by far the safer way to fill all canals that can possibly be filled, even though they require reaming

and enlarging for the purpose. Have many times removed fillings from abscessed teeth and found the larger canals filled, but the smaller ones left untouched. The fact that cleansing, treating and filling these, resulted in a complete cure, is some evidence at least that the neglected canals were the cause of the trouble. As an experiment, I have frequently filled the larger canals, leaving the very small ones to take care of themselves, filling the cavities temporarily, and after a few weeks removing the filling, and the offensive odor, which I have invariably found to be present, is sufficient evidence to my mind that such is not safe practice. Have often been asked if I fill three canals in the upper molars. Will say that I do almost invariably. Indeed, do not now recall a single case of a first upper molar in which I have failed to find and fill three canals, for at least eight or ten years, and but two instances of failure to find the third canal in the second upper molar, and perhaps three or four in the third, during the same period. I do not claim that these have *all* been filled *thoroughly* the entire length. This, as we all know, would in many cases be an impossibility; but have approximated thoroughness, as far as patience, perseverance, and my limited ability could do it. Am decidedly of the opinion, that if the profession generally felt that they were to receive a fee for these operations, commensurate with the time and labor necessary to be expended, greater thoroughness would prevail, and consequently more uniformly successful results be attained. The theory, that if the *end* of the canal is perfectly sealed, the balance may be left unfillled, while theoretically correct, is, I think, objectionable in practice, as we can seldom, if ever, *know* that the foramen *is* entirely closed. If it *does* leak, the open canal becomes a reservoir for the accumulation of moisture, which soon decomposes, and the gases thus generated escaping through the leaky plug, become a source of irritation to the surrounding membrane.

As previously stated, the treatment of an alveolar abcess depends upon the cause, and the condition in which

we find it. If in the earlier stages of inflammatic the cause is a dead or putrescent pulp, the thorough removal of the cause, with antiseptics left in the roots, and aconite and iodine applied to the gums, relief will generally soon follow, and an abscess be prevented. Among the various means resorted to for the purpose of preventing suppuration, are leeches applied to the gums, hot foot baths and cathartics, often with beneficial results. I am of the opinion, however, that where the inflammatory symptoms are sufficiently severe to require constitutional treatment, aconite and belladonna will usually afford all the relief that can be derived from the use of cathartic medicines. The heat, swelling, redness of the parts, the hot, dry skin, full and bounding pulse, pain in the head, and thirst, which are usually present in such cases, are symptoms more readily controlled by aconite and belladonna than by any other remedies I know of. I prefer either Fleming's tincture of aconite or the German tincture. Of the former, I generally use half a drop at a dose; of the latter, one drop. The belladonna I prefer in the second or third decimal attenuation, in one or two drop doses. These, in severe cases, can be given in alteration every half hour for two or three hours, when the interval can be lengthened to one hour, and, as the inflammatory symptoms subside, to two hours. The common tincture of belladonna, usually kept in the drug stores, is unreliable. The best I have ever used is the German tincture, obtained from the homœopathic pharmacies. The local remedies principally used in the treatment of alveolar abscesses are creosote, carbolic acid, iodine, salicylic acid, and the aromatic sulphuric acid.

The treatment after the cause is removed consists in bringing the remedy in contact with the pyogenic sac, cauterizing its entire surface, to break it up and promote healthy granulations. This is accomplished by injecting through the fistula, where one exists, with a Farrar's syringe, or by pumping the medicine through the root

canal where it is possible, using cotton wound on a broach for a piston. It often happens, however, that no fistula has been formed, and it is impossible to force the remedy through the canal. It has been recommended, in such cases, to drill through the root. This, in perfectly straight roots, if carefully done, is not bad practice; but, as we can never know positively that a root has not some curve, such a course is always risky. It is a little over eight years since I abandoned this practice; at that time two teeth were lost from this cause—an upper bicuspid and lateral incisor. The roots of both these teeth having an abrupt curve near their apices, my drill came out at the sides, I then decided to try cleansing the canals, treating with antiseptics, and trusting to nature for a cure.

When I state that no abscessed tooth has been lost since that time, where an opportunity has been afforded for carrying out my treatment, it will be inferred that the change has been a satisfactory one. The remedies which have given me the best results are the creosote of commerce (probably oily carbolic acid and creosote) and iodine. These I combine by dissolving the iodine in the creosote, leaving an excess of iodine.

After cleansing and drying as thoroughly as possible, I swab the canals with the remedy, using cotton wound on a broach for the purpose, leaving cotton in the canals saturated with the medicine, and sealing with a temporary filling. If the liquid is carried through the foramen, as is often the case, a burning sensation will be experienced. If the *liquid* does not go through, the vapors of the iodine will, if the cavity is perfectly sealed, unless the root is absolutely stopped. I treat these cases upon the hypothesis that where there is sufficient opening through the canal for the gases from a decomposing pulp to escape, the vapors of iodine will find an exit—am not certain but the vapors coming in contact with the sac are quite as efficacious as the liquid, though where I *know* there is pus, I am not careful to prevent the medicine from going through in

liquid form. On the other hand, where I doubt the existence of pus, I *am* careful to prevent the liquid from passing through the root, as an escharotic applied to the already inflamed membrane would likely result in suppuration. The vapors, instead of being escharotic, act as antiseptics and gentle stimulants to the membrane and weakened coats of the vessels. As an evidence that the iodine does find its way through the roots in some form, I will mention the fact that in nearly every case where a fistula exists, the patient complains of the taste of iodine until the fistula heals, although the cavity is filled as perfectly as I can fill it. Thinking perhaps my gutta-percha fillings leaked, I have filled, in some cases, with cement, and the taste of iodine continued. Where no fistula exists, soreness sometimes results from stopping up the cavity, and the patient should be instructed to return at once, or remove the temporary filling, if necessary. The cases in which trouble is most likely to occur are nervous, debilitated patients, confined by indoor employments. The operator should be governed by the condition of the patient at the time of treatment, whether it will be safe to seal up the cavity or not. The menstrual period, in delicate ladies suffering from uterine diseases, and the first months of pregnancy, are conditions requiring extreme caution.

I find by experiments out of the mouth, that iodine will go through the roots where carbolic acid will not. This was tested by winding the roots with cotton, and imbedding all but the crowns in plaster. I am aware that the conditions are not the same as in the mouth, but the fact that the odor of the iodine was found upon the cotton where no trace of the acid could be discovered, is evidence that the vapors of the iodine found an exit through the apicial foramina, where the acid did not. The principal objection urged against the use of iodine is that it discolors the teeth. Alcohol and carbolic acid have been used to wash it out. This they do by dissolving it, but at the same time it penetrates the dentine, leaving a slight stain. Aqua-

ammonia possesses the property of neutralizing the color of iodine; therefore, if the cavity is immediately washed with it, no stain remains. A colorless tincture of iodine is made by adding about one drachm of ammonia to one ounce of the tincture. In this proportion, the color disappears in about forty-eight hours. I have been using this, to a limited extent, for a few months and think it will prove a useful remedy. It certainly seems to arrest the secretion of pus promptly. For injecting a sac through the fistula, I know of nothing better than an alcoholic solution of salicylic acid. This, if the root is properly cleansed and treated, and the patient is in fair health, will usually effect a cure. In those cases with large foramina, where chronic inflammation remains after the secretion of pus has been arrested, considerable benefit may be derived from the use of the tincture of hydrastis, calendula, or sulphate of zinc and sulphate of morphia, each five grains to the ounce. The cotton in the canals should be changed frequently during treatment, as, if left too long, it becomes offensive, causing irritation to the already weakened membrane. External poultices should never be used in the treatment of this disease, neither should an abscess be allowed to break upon the face. Where poulticing is necessary, a roasted fig applied to the gum, is sufficient. I stated that no abscessed tooth had been lost during the past eight years where an opportunity had been afforded me for carrying out my tretment. While this is true, I wish to state distinctly that I have no idea that I can treat every case of this disease successfully. That I have been fortunate, I admit; but may fail in the very next case. I mentioned the fact reluctantly, and solely for the purpose of encouraging others to greater thoroughness and perseverance. I have two chronic cases under treatment at the present time which have given me considerable trouble, but both are nearly well, and I hope to save them. Will mention a case or two, which may be taken as an average of my cases and their treatment. Case 1st, June,

'76.—Mrs. I., abscess right superior first molar. Tooth sore, face and gums swollen and very painful; had been under treatment for weeks. She had been told it would require from six weeks to three months to effect a cure, with doubt expressed as to the result. Applied rubber dam, carefully excavated the cavity, and found that an attempt had been made to extirpate the pulp, through a small opening in the pulp chamber, which was so far from being successful that the buccal canals had scarcely been touched. Spent half a day of diligent labor in cleansing these canals; syringed, dried, and treated with the iodine and creosote, as before described, sealing up the cavity as usual. Painted the gums with aconite and iodine, and dismissed the patient. In a few dayr the tooth was nearly well. I treated as before, and in three or four days filled the roots. In one week, filled the crown with gold. Last winter saw the case, and found it had given no trouble. Case 2d, April, '81.—Mrs. C., from an adjoining town, abscess of left inferior first molar, with pus discharging through fistula; also, pericementitis of right inferior first bicuspid, Was half a day cleansing these canals; treated and filled, temporarily, as described; came again in one week, and both teeth, apparently, perfectly well. Filled root in bicuspid, and changed cotton in molar, not having time, between trains, to fill the roots.

Occasionally chronic abscesses, occurring in debilitated patients, require something more than local treatment. It is well known that if an ulcer or canker patch upon the lip or cheek is cauterized while the patient is debilitated, it is made worse; but if a tonic is administered for a few days previously, one application of the caustic is usually sufficient for a cure. The same is true in the treatment of abscesses. This is illustrated in the following cases: A colored girl, with abscess of the antrum, was treated locally for some weeks, and at times it appeared nearly well, but would again suppurate. A tonic of quinine and iron was prescribed, and the local treatment continued as before.

From this time there was a marked improvement, which continued until a permanent cure was effected. A lady about seventy years of age, having worn an entire artificial denture for twenty years, was suffering from an abscess of the anterior portion of the superior maxilla, which had been treated by her physician for some months, local treatment being continued after coming under my care. This, like the former case, was cured only after the administration of a tonic. One more case I desire to mention, is that of a lady recently recovered from an attack of intermittent fever, and also debilitated by nursing a large healthy boy the second summer. An abscess of the left superior lateral incisor resisted all local treatment until a tonic was administered, after which one application of salicylic acid to the sac through the fistula effected a complete cure.

I have omitted, but wish here to state, that the only certain test I have ever found for the vitality of a pulp is the rhigolene spray applied to the tooth after it has been isolated by the adjustment of the rubber dam.

In conclusion, I will say that, aside from necrotic conditions, I think failures result principally from four causes, viz: imperfect cleansing of the pulp chambers and root canals, forcing foreign matter through the foramina, over medication, or the too frequent application of caustic remedies, keeping up the secretion of pus; leaving cotton too long in the roots until it becomes offensive, causing irritation; and finally, by not paying sufficient attention to the general health of the patients.

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## ARTICLE II.

### *Origin, Definition and Division of Tissues.*

BY C. HEITZMANN, OF NEW YORK.

The formation of tissues is a question much discussed by biologists and embryologists. New, and it is expected plain views can be obtained concerning this difficult matter,

by reducing the germ of the higher animals into the schema of a single lump of bioplasson, f. i., an amœba. Such an atttempt of simplifying the ideas of the significance of the "germinal layers" is made in this article.

ORIGIN.

All complex organisms—the higher developed animals—originate from an ovum of the female impregnated by the admixture of spermatozoids of the male. The ovum being enclosed by a hyaline layer (zona pellucida of Von Baer,) is composed of living matter, in reticular arrangement (the germ of Remak,) which contains a nucleus-like body, the vesicula germinativa with a varying number of coarser granules, the nucleoli, the maculæ germinativæ. In mammals and some amphibia, the germ *in toto* is transformed into the animal, whereas in the eggs of birds, scaly amphibia and osseous fishes, a portion of the germ is changed into yolk which serves as a pabulum. After the spermatozoids have entered the germ and after fructification has taken place, its living matter increases rapidly, the vesicula germinativa disappears, and the germ, by a process of division, splits at first into two portions, seperated from each other by a light, narrow rim, but connected by extremely delicate filaments which traverse the light rim. Each half of the germ splits into a number of lumps which, in the same manner as the first half, remain connected; thus the segmentation of the ovum results in the formation of numerous corpuscles, which by collecting in a flat layer represent the germinal disk of Pander in the germ of the impregnated egg of the chicken. The segmentation was first observed by Prevost and Dumas (1824,) in the ovum of frog; by Coste (1848,) in the ovum of fowl, and by Bischoff (1842,) in the ovum of mammals. According to the last-named observer the subdivision into smaller elements in the rabbit's germ does not go on uniformly throughout its whole extent, inasmuch as in the germ a cavity is formed around which the elements of segments

tion accumulate, in order to build up the germ-membrane proper with a slightly thickened spot, the germ hill of Von Baer.

The first differentiation of the germ-disk, or the germ-membrane, consists in the formation of layers, of which at first two, shortly afterward three, are recognizable. The formation of such layers became known first through the researches of Caspar Friedrich Wolff (1768,) who claimed that the whole system of the intestines is developed from simple laminæ. Pander, in 1817, perfected the theory of Wolff; he knew that after hatching had continued for twenty-four hours, three easily separable layers could be found in the germ-membrane. Von Baer, in 1822, described four layers, of which the two upper he termed the animal, the two lower the vegetative. Remak, in 1855, maintained that the germ-membrane of the impregnated but unhatched egg consists of two layers, and that, upon hatching, the lower is again split into two layers, the lower of which lines the one above it like an epitheial cover. Having ascertained the individuality of each of these three layers, he endeavored to find out their relation to the developing organs; he called the upper layer the horny or sensorial; the middle layer the motorial and germinative; the under layer intestinal and glandular. According to S. Stricker's researches (1860–1870,) the original under layer of Remak consists—at least above the germ-cavity, and before the middle layer has made its appearance—of only a single stratum of flattened cells, and the formation of the middle layer is due to the immigration between the two layers of new cells. He termed the upper layer of Remak the combined horny and nervous layer, as he found that in batrachia the horny layer is quite distinct from the nervous layer, the former being uniformly thin, the latter, on the contrary, thickened even in the earliest stages in that part where later the brain is formed. He is unable to confirm, despite of Remak's positive assertions, that nervous elements are also developed from the middle layer.

Stricker (Manual of Histology, American edition, 1872,) in speaking of the development of the fowl's germ, says: "The cells of the under layer change their form and arrangement during the first hours of incubation. They become flattened, and, when seen in tranverse section, appear spindle-shaped. Hence, after incubation has gone on for a few hours, we can ascertain beyond even the shadow of a doubt that there are two, and only two, layers. * * * The under layer, immediately after its separation from the subdivided germ, consisted in some places of a single thickness of cells, while in other places, in a transverse section, small heaps of cells could be recognized projecting from the layer. * * * Peremeschko, however, has made the communication that the large grandular cells, lying on the bottom of the germ-cavity, increase very considerably in numbers during the first hours of incubation. Now, since with this increase in numbers there is not at the same time a corresponding diminution in size, it is very natural to suppose that the cells which project from the under germ-layer fall to the bottom of the cavity. This suggestion appears all the more probable when we recall the fact that some of the elements of segmentation, which are situated in the lower portion of the germ, remain lying at the bottom of the cavity at the time when the germ, in the production of this very cavity, separates itself from the adjacent parts. * * * We are led to conjecture that the grandular bodies, which before lay at the bottom of the cavity, have found their way to the space between the two first germ-layers." Stricker, based upon Oellacher's researches, says that similar relations are also found in the trout's germ.

At present investigators agree that the body of vertebrates is at first a flat sheet consisting of three main layers, for the designation of which the following names have been proposed; *epiblast*, the upper layer; *mesoblast*, the middle layer, and *hypoblast* the under layer. Of these the epiblast and hypoblast are very thin, composed of but one

layer of plastids, whereas the mesoblast is a bulky heap of plastids, all of which are interconnected and represent the main mass of the future organism. As the originally flat sheet of the germ becomes curved downwards so that the two lateral halves are bent toward the median line, where they grow together, cavities are formed in the interior of the germ, which are lined by the under layer and its derivatives. The horny layer furnishes the external covering of the body and lining of the external glands, while the under layer provides the lining of the intestinal cavity and its glandular organs. Linings of this description are called "epithelia," and it follows that the epiblast and the hypoblast give rise to all epithelial formations (including the crystalline lens;) the hypoblast to those of the intestines and their glandular elongation and accumulations. The main bulk of the body is a product of the mesoblast; from it proceed the tissues termed connective tissue, which exclusively contains blood and lymph vessels, muscles and nerves, the latter arising from the uppermost portions of the mesoblast.

### DEFINITION.

In comparing the earliest formations of the germ with a single plastid, formerly called a "unicellular organism," or a "protoplasmic body," such as the amœba, valuable hints may be obtained as to the significance of the three germinal layers. The amœba is covered by an extremely thin layer of living matter. If the amœba be flattened out and bent, its cover will represent the upper and under thin layer of the germ, which exclusively serves as an investing layer of both the outer surface and all cavities of the body, being directly or indirectly connected with the outer world. The main bulk of the amœba is living matter in reticular arrangement with thickened points of intersection of the threads of the network; this matter, retaining in the mesoblast and its derivations its reticular shape, furnishes in higher organisms, as a result of a sort of division of labor, the tissues. The nature of the tissues is determined: firstly.

by the manner in which the living matter is distributed, and secondly, by the chemical changes of the fluid contained in the meshes of the reticulum. Tissues are complex formations of living matter in a network arrangement. The meshes of the network contain a liquid which allows the living matter to exhibit contractility in a high degree, as in muscles and nerves, or the network contains a more or less solidified basis substance, which limits its contractility as in the solidified basis substance, mainly serves as a support for the more active tissues (muscles and nerve), and as a carrier of liquids in closed spaces.

### DIVISION.

According to this view, there are but four elementary tissues in the animal body. All these are interconnected and built up on one and the same plan.

1. *Connective tissue.* In this the reticulum of living matter contains in its meshes a more or less solid, nitrogenous (glue-yielding) basis substance; while points of intersection rich in living matter, suspended in a liquid, represent the connective tissue corpuscles. Of all tissues, only the connective tisssue carries in closed vessels the liquids which serves for nutrition, such as blood and lymph. Aside from this and acting as support for other tissues, its physiological activity is relatively small.

2. *Muscle tissue.* The reticulum of living matter at its points of intersection consist of more or less regularly distributed large prismatic, cylindrical or granular thickenings (sarcous elements,) connected by thin filaments, while the meshes contain a liquid which admits of powerful contractions of the living matter in large territories. This tissue is the motor apparatus proper. It is accompanied by and attached to connective tissue, carrying the vessels.

3. *Nerve tissue.* Here the living matter is arranged in the shape of either a very delicate reticulum with very small points of intersection (ganglionic corpuscles, gray matter,) or in delicate solid cords (axis cylinders,) while the meshes contain a liquid which allows the living matter in

limited territories to contract rapidly. This tissue serves as an apparatus of sense impression, intellect, and sensory and motor conduction. It is largely accompained by and mixed with connective tissue, carrying blood vessels.

4. *Epithelial tissue.* The reticulum of living matter is very delicate, and arranged in flat layers, which at certain regular intervals contain a horny cement-substance. The function of epithelial tissue is to cover the surface and the cavities of the body; it alone serves as apparatus of secretion, and for the formation of the essential parts of reproduction: spermatozoids and ovum.—*New England Journal of Dentistry.*

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## ARTICLE III.

### *Operative Dentistry.*

BY DR. GEO. S. MILES, OF JERSEYVILLE.

[Read before the Illinois State Dental Society, held at Rock Island, May 10, 1881.]

In responding to the request of the Executive Committee, I do not expect to say anything that will be new to the members of this Society.

I presume the committe felt that this branch of the profession was of such importance that some space in the programme should be allotted to it, if but to open the discussion, which may be so profitably continued by the members here present.

Nearly all the different pursuits in life, trades and professions, are divided into sections or branches in such a manner that a person following one or two will achieve greater perfection and influence than if he endeavored to attend to all the different branches of the trade or profession with which he is connected.

In the manufacture of the watch; an article so indispensable to every gentleman; instead of the manufacture

of all its many parts being confided to one individual, the mechanism of it is divided into many sections, and one person gives his or her attention to one particular part, another to another, and so on until the beautiful chronometer is produced, each part fitting with exact nicety, and keeping time to the delight and admiration of the most critical.

The steam engine, printing press, electric, telegraphic machine, and many other important and wonderful invention that are interwoven with the welfare and business existence of the race, could never have been produced and made to perform the duties required of them with that exact nicety and satisfaction but for the fact that their several parts were allotted each to skilled workmen of tried capacity.

The same principles applies to the several professions that does no mechanical arts. The practitioner at law could not have attained the high position that many of the profession in this country now occupy, had they undertaken to counsel and advise within the whole range of jurisprudence, for it is patent to all that the most eminent practitioners, those who have accomplished the most for their clients, as well as themselves, are those who have confined themselves to a limited range of practice.

The same principle applies to the practice of medicine, and especially is such the case if dentistry is a specialty in medicine. Not many years ago it was not unusual for a person to combine the practice of dentistry with some other calling or profession. It seemed to be quite popular for clergymen to divide their clerical labor with dental practice; I suppose, with the idea that while ministering to their spiritual needs they could also attend to their physical requirements, and at the same time replenish their exchequer. So far as my knowledge extends, these gentlemen have been about equally successful as preachers and dentists, and as the standard of dentistry has advanced, they have found there was enough range in their profession

to engage one person's attention, and they have withdrawn, and many are now in the insurance business, for which I presume they are better adapted. All agree at this day that there is enough in the practice of dentistry to demand a person's whole attention. How best to acquire the proper information and practical experience to fit a person for the work, is the conundrum. A thorough knowledge of medicine is no disadvantage to the dentist, but it is certainly an accomplishment. The same may be said of law and theology.

It is not deemed important that a practitioner at law should understand theology, or that the teacher of theology should be profound in the mysteries of law; and while dentistry may be considered to be more intimately connected with medicine than the other professions are with each other, the graduate of medicine is very poorly fitted to practice dentistry; and yet he should be, and is, I doubt not, prepared to practice surgery, treat diseases of the eye and ear, and many other diseases of the system which are recognized as specialties in medicine when practiced as such. Wherever dentistry is introduced in a medical school an additional corps of teachers is required, and at the present day, as they exist, I have no doubt the graduate of medicine obtains information that he would not receive but for this fact. At the same time the dental student is benefited from what instruction he may receive in medicine. But as no one person can know everything, it does not seem important that a dental student should be required to pursue and understand all of those branches of medicine and the nature and treatment of all the diseases of the human system, when he never expects to make any use of the instruction thus obtained; but thorough instruction in all those branches of dental science and art, the pathology of the dental organs, and the treatment of those diseases in any way connected with the oral cavity, or appertaining to the duties of the dental practitioner, would prepare the student better for the work selected. The mind of the

dental student should not be diverted from his subject, but his whole attention given to the central aim of his life.

The subject of operative dentistry presents a wide field for scientific investigation and artistic study. From infancy to old age the operator is called upon to diagnose the many troubles of the oral cavity, and exercise what knowledge and skill he possesses in ministering to the needs of those thus afflicted. Very few people in this era are exempt from the necessity for the services of a dentist; hence, it is very important that thorough investigation be made of each case that presents itself so that correct conclusions may be drawn, and a proper course of treatment decided upon.

In examining the teeth, a delicate instrument is needed to inspect carefully each tooth, the interstices in the grinding surfaces, between the teeth, around the necks of the teeth, and often under the gums. In many cases this can only be done satisfactorily by the use of floss silk, drawn between the teeth, and by wedging the teeth apart.

Before commencing to fill teeth that are decayed, it is often best to remove every particle of tartar that may be attached to them. In some cases it is imperative. No one should allow a patient to go from his office understanding her work completed, who desires her teeth put in proper condition, without seeing they are perfectly free from tartar, and the patient instructed how to keep them free from the accumulation.

Upon examination of a case we find quite a number of teeth decayed in different parts of the mouth- In filling teeth that are decayed upon the proximal surfaces of the incisors, sufficient space should be made to prepare the cavity, insert the filling, condense and finish the same in a proper manner. How best to obtain this space so that the filling may be firmly condensed around the margins, and after completion the tooth present the proper shape for durability and general appearance, is the question.

Judgment must be used as the case presents itself, depending upon the quality, shape and position of the teeth

and the extent of the decay. Where the incisors are considerably wider at and near the cutting edge, the proximal surfaces touching each other, with decay near the neck of the tooth, reaching near the point of contact, I think the space should be obtained by wedging. This may be accomplished with cotton or orange wood, as you prefer. Very little, if any, filling should be done, from the fact that very soon after the operation is completed, the teeth will come in contact again, and the surfaces filed would be broader, and without the rounded contour which was natural to them. Substances would collect between them, and decay would be more liable to supervene. Where the decay is near the cutting edge, in proximal cavities, and the position of the teeth to each other such that they would impinge upon each other even after considerable tooth structure was removed, I would prefer not to injure the shape of the tooth by removing much of the tooth substance, but obtain space by wedging and by taking away only the slender edge of the walls, or portion of the walls, and retain the proper shape of the teeth—the contour of the filling depending upon the extent of the decay, but so shaped that as small a portion as possible would press upon the adjacent tooth. A flat surface should be avoided in proximal fillings, and care should be taken that the other extreme be not reached, and a too prominent contour given to the filling for permanency.

If practicable, the teeth should be left, after the fillings are completed, with a narrow space betweeen them, in order that they may be the more easily kept clean. The molars and bicuspids not being so exposed to view, while it is desirable to retain a proper shape, I do not deem it as important to retain so closely the shape of the tooth as in the incisors, but such separations should be made and frail walls cut away as will enable the operator to insert a filling for the longest period.

Much has been said and written during the past few years in regard to materials for filling teeth—considerable

that is quite valuable ; not a little that I believe had better not have been written, if indeed it has not been pernicious in its influence upon others who may have inclined to a system or adopted suggestions without sufficient investigation.

There has been a tendency to run to extremes in the use of materials and appliances in our profession, and also an inclination to follow in grooves or the tracks of others, rather than to exercise one's own judgment of what is best for each individual case.

Of the materials for filling teeth, gold should stand *first* as the *jewel* to take the place of lost tooth structure. By far the larger proportion of teeth may be filled with gold in some of its forms of preparation, in a more durable manner, and present a more beautiful and cleanly appearance, than other now discovered preparations; especially is gold preferable for the incisors and cuspids. There are many large cavities of decay in the molars and bicuspids, where the walls are frail, in which an amalgam preparation may be used, and preserve the teeth for a longer period than if the cavities were filled with gold. Indeed, teeth may be filled with this material the walls of which are so frail that it would be nearly if not quite impossible to fill with gold. Again, the expense of inserting these large gold fillings is such as to debar many from having their teeth attended to, unless some cheaper material can be used. They cannot afford to pay the price for these large gold fillings that would be equitable—at least they think they can not, and they will not—and the question hinges right here: Shall these teeth be allowed to continue in their onward career to destruction, and ultimately be shelled from the mouth as you would shell peas from the pod, by the artificial tooth *fiend*, or shall we arrest the decay and fill these teeth with amalgam or tin, as the case may be? I believe in saving the teeth. One reason for the dislike of amalgam has been, I think, the quality of the preparation, and the neglect in the preparation of the cav-

ity of decay, and the proper introduction and finishing of the filling. Quite as much care should be exercised in filling with amalgam as with gold.

It is equally important to use the rubber dam, for it is very essential to keep all moisture from the filling, while it is being inserted and for an half hour or more after. By this means you are able to finish the filling in a more perfect manner, giving it a finer and more complete finish after the material has hardened considerably, which is a great desideratum.

Attention should be paid to the saving of children's teeth, so that they may be used for mastication, until the natural period for their removal, for the permanent set. Tin foil and gutta-percha are very good materials to use in these teeth, and will generally fulfill the requirements demanded of them.

Many operators have a preference in the amalgams now manufactured. Others seem to act upon the theory that they are all of about the same class, and use the cheapest. Each manufacturer claims his to be equal if not superior to others. The opinions of those qualified to judge, who are not interested in the sale of the article, I think would be preferable. But I think what would be still better would be the appointment of a competent committee by this society, or by the "American Dental Association," to investigate and experiment in regard to the proper ingredients, and the relative proportions of each, until (if possible) they can report a formula of a preparation that will not shrink from the walls, and that is not injurous to tooth structure if proper care is taken in introducing the filling.

The operative dentist is often called upon to perform operations in the oral cavity, other than filling teeth. His ingenuity and skill are not infrequently brought into use in correcting irregularities of teeth. Children's teeth, in consequence of the neglect of parents, or imperfect development of the maxilla, are very often crowded from that symmetrical position designed by nature, and present a

very forbidding appearance. In youth this condition of affairs may be changed. The crowded condition being removed, not only is their liability to decay greatly lessened, but a wonderful change wrought in the whole facial expression of the patient. At times this would require the removal of a bicuspid or molar, to make room, but very seldom, if ever, the extraction of any tooth anterior to these; for it is very important that the incisors and cuspids should be saved for general appearance. Various, and in some cases quite ingenious, appliances are constructed for changing the position of the teeth, requiring considerable time in accomplishing the purpose; but often this can be effected very easily by the use of silk ligatures attached to the teeth, connected with rubber rings. Frequently we see an incisor that has been allowed to strike behind the lower teeth. This position may be very readily changed by adjusting a plate over several of the lower teeth, so arranged that the incisors desired to be removed will strike upon an inclined plane in closing the mouth. We see teeth almost every day with exposed pulps. It is highly important to preserve this vital principle of the tooth, if possible. This can be done if there is no inflammation, or chronic disease, in or about the organ, by covering the nerve with Fletcher's or Weston's preparation. The antiseptic pulp dressing of Dr. Spalding I believe is a very good article for this purpose; covering it with oxychloride and, after the zinc filling is hard, fill the tooth as usual. If the pulp is in an inflamed condition or dead, it should be removed to the apex of the root, the nerve cavity purified, and the canals filled, care being taken to hermetically seal the nerve cavity at the apex, that no moisture may permeate the filling

Many teeth are neglected until the crowns are broken off, or nearly so. In many of these cases, if the root is strong, I think it better to attach an artificial crown than to remove the root and subject the patient to the necessity of wearing a plate. While it is possible and practicable to save the root of a tooth, it should be allowed to remain,

and perform the function for which it was designed. The pathological condition of the teeth and oral cavity generally should receive careful attention at the hands of the dentist. From childhood to old age there are many diseases of the teeth, gums and alveoli that require attentive care, or serious results are sure to supervene. But it is impossible, nor is it necessary, to allude to them at this time, as they will be treated, or have been, in papers devoted to those special points.

Each year is developing some new thought, new method, new material. May it be ours to discriminate in their application, and act intelligently to elevate the standard and advance the interests of our profession.—*Report of Illinois State Dental Society.*

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## ARTICLE IV.

### *What is Facial Neuralgia?*

BY PARSONS SHAW, D. D. S., MANCHESTER, ENGLAND.

I have been requested to report the following case and do so for the sake of its lesson, the names of all the parties, for obvious reasons, being suppressed. A well known dentist in one of our largest cities was called in consultation with the regular medical attendant to see an old patient, a merchant, whose loss would not only be irreparable to his family, but also keenly felt throughout a wide commercial circle. By the express desire of the patient no intimation of his symptoms was conveyed to the dentist, in order, I presume, that he might obtain an entirely unbiased opinion from that gentleman; and he proceeded to state that he had been confined to his house for more than a month, and for some time even to his bed, with what had been pronounced a severe attack of neuralgia, and for which he was then under treatment. He described his pains as mostly confined to one side of the face, but often shooting

through the entire face, and frequently extending into the head, neck, back, and even more distant regions. The dentist inquired into the condition of the teeth, and was told, what proved to be true on examination, that they were not at all decayed or sore, but that a little matter had been observed at the edges of the gum. He could not say, at the time, he had noticed any discharge of pus from, or had perceived any fœtid smell in his nose; but afterwards remembered that he had. There was no very perceptible swelling of the face, yet the patient pointed to a sore place just beneath the eye, and close examination showed it was a little puffed on the side where the pain was mostly felt. He had become very weak, and his whole system was generally deranged. Every intelligent dentist who has read thus far, will have concluded—as did the dentist consulted, in less than five minute's time—that this patient was suffering from a severe attack of inflammation in the lining membrane of the antrum When the regular medical attendant heard this opinion, he at once concurred in it, and also ageed to the desirability of the course of treatment suggested by the dentist for the discharge of the accumulated pus in the antrum. But before he would consent to any operation, he insisted on having the opinion of a certain eminent surgeon. Two days were thus allowed to pass before this gentleman could be got in attendance, the patient's sufferings going on, and the chances of his recovery being greatly reduced in the meanwhile. In time, however, the physician, surgeon and dentist met, when the strong advice of the latter was acted upon, and a molar tooth removed, with the understanding that if this did not procure sufficient discharge of pus from the antrum, an opening was to be made by means of the dental engine. The tooth was removed with very little exertion, and a considerable quantity of matter discharged, but it was evident that little of it came from the antrum. The dentist, in due course of time, took his leave, quite expecting to be again called as soon as the patient had recovered somewhat

from the first, to perform the second operation, which all had so far agreed with him to be necessary for the removal of the primary cause of the illness. But, to his great surprise, he was not again consulted, beyond being asked, a few days after the extraction, to determine a dispute which had arisen between a fourth authority—a consulting physician who had been called in—and the attending physician, as to the character of several pieces of necrosed alveolus which the patient had removed with his fingers, the eminent consulting physician having declared it was a part of the tooth which the dentist must have broken in the extraction? As the dentist was not again consulted, he only knows what took place informally, and not from his own observations; but the information is sufficiently accurate for us to come to a definite conclusion.

As the patient got gradually worse, it was given out, as the result of the combined wisdom of his medical advisers —minus the dentist—that he was suffering from a *complication of disorders*, such as neuralgia sciatica, gout in the feet, Bright's disease, etc., as if each of these were idiopathic, accompanied by intermittent febrile symptoms. In about eight or ten days after the removal of the tooth, he had a severe rigor, which was repeated at irregular intervals; and in just fourteen days after the operation, he died. If the dentist has had no difficulty in determining the exciting cause of this patient's disorder, neither will the thoughtful physician be at a loss to understand from what he died. Never did symptoms point more clearly to a case of pyœmia. The pent-up pus which had been allowed to accumulate in the antrum for more than a month before the cause of his symptoms was discovered by his dentist, had, in all probability, wrought sufficient mischief to render the patient's recovery doubtful; the more especially as the alveolus was found to be so much necrosed as to come away in large pieces; and albuminuria had already developed. Yet, if the antrum had been opened, as was advised, and the matter removed, and an antiseptic treatment

adopted, there was still a fair chance of recovery, as the patient lived two weeks after the removal of the tooth ; and while there were febrile symptoms, there was no rigor for some time. whereas, death from blood poisoning, results, as a rule, in from four to ten days. The possibility of recovery was also heightened from the fact that the patient had a good constitution and enjoyed excellent health. Yet so prepossessed were the minds of those who were responsible for this life, that they were apparently not able to make out a correct diagnosis, even after the key to the situation had been placed in their hands by the dentist, and the patient was left to linger on in pain, and be finally lost to all his usefulness, except that of allowing me to point out the error which led to such a catastrophe.

It is not pleasant to look back on a case like this, and nothing but a strong sense of duty, and the conclusion to which it unmistakably points, could induce me to do so. Is it not high time that dentists took this "facial neuralgia" theory in hand and exposed its errors, and, as we have seen, sometimes fatal consequences? It is not diagnosis, but pure charlatanism, to tell a patient who consults a medical man for the relief of a facial pain, that he has a "nerve pain." He knew that quite well enough, and what he wants is relief. But it is not proceeding towards this desirable end to assume that a pain cannot better be defined than by the use of a term the patient does not, as a rule, understand ; or if he does, concludes it is one of those general terms, which has, by common consent, become crystalized into a definite meaning, which is well understood by those who use it ; that his symptoms are his disease; and by the confident manner in which he is thus assured, lead him to believe that, even if he does not understand the meaning of neuralgia, the doctor knows all about his case. It is a common occurrence to find patients treated for weeks, and even months, for neuralgia, while any intelligent dentist would, from the patient's description of the symptoms alone, at once say they arose from either

odontitis or periodontitis; or, failing these, inflammation of the lining membrane of the antrum, and this apparently without a suspicion on the part of the medical attendant that the pain had any such origin. Even when alveolar abscess has caused the face to swell, I have known men, justly regarded as eminent physicians, to treat the patient for erysipelas. And, also, when the pus had been induced to approach the surface by means of powerful irritants, to lance the face in order that it might discharge in that direction, and then declare it a case of scrofula. There can be nothing without a cause; yet, so-called facial neuralgia is regularly treated as if it arose without any definite cause, or from some general or remote cause, which was quite too obscure for anything like accurate diagnosis, while in nine cases out of ten the origin of the pain so described stares one in the face the moment the mouth of the patient is examined; and almost invariably is only obscure to inexperienced or superficial observation. So true is this, that to the astute dentist no meaning will be attached to such a term as facial neuralgia, for he knows that if the pains do not arise from some lesion in or around the teeth, or in the antrum, the origin may then be looked for deep in the neural axis; in which case the patient is in a condition to demand the most anxious attention of his medical adviser and nearest friends. Some years since I had just such a case in my own practice. The patient complained of pains in his head and face after I had made certain they could not arise from his teeth. When he applied to anyone else for advice he was assured he had "neuralgia," and my suggestion that his was in some way affected, received no encouragement from the physicians he consulted, simply because they regarded his pains as an ordinary form of what they taught him was a well-defined complaint. In time he died so suddenly that a post-mortem examination was required, and I was ordered by the coroner to attend it, when, after much search, the pineal gland was found a mass of disorganized matter. The erratic pains were then accounted

for by some disturbance in the reflection of nerve irritation.

Such cases as are here named might be repeated by the score by any observant dentist. Yet we allow them to go on, and the general practitioner to assume superior knowledge, where we should always teach.—*Missouri Dental Journal.*

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## ARTICLE V.

### *Removal of Naso-Pharyngeal Polypus by Nelaton's Operation—Death.*

Dr. Robert F. Weir related the history of an operation for removal of a naso pharyngeal polypus, which had some points of extreme interest.

The patient was a boy, aged eight. A year ago he had had diphtheria, and this was followed by the "snuffles." This symptom did not attract attention for some time. It was at last noticed that he could not sleep in the ordinary position. He then began to have nasal hemorrhages.

He was taken first to a quack who blew powders up his nose. He then went to a physician in Newark, who tried to remove the tumor, which hung down just in view, by splitting the soft palate after Manne's method. The child developed some alarming symptoms from hemorrhage and shock, and was resuscitated with difficulty. Recently he was sent to Dr. Lefferts, of this city, who turned the case over to Dr. Weir.

The child was then in hardly a fair condition of health, but no delay in order to improve him was allowable on account of the recurring hemorrhage and disturbed sleep.

An examination showed the tumor to have encroached anteriorly in the nostrils, but not entirely to have occluded them. It also hung down nearly to the base of the tongue. The tumor was thought by digital examination to be attached to the base of the basilar process of the occipital bone.

The points to be determined before operating were: (1) the kind of operation; (2) the question of preliminary tracheotomy.

*First.*—The experience under the first head, in this city, was embraced in the cases of Dr. Sands and Dr. Peters. They had adopted the plan of taking out the lower portion of the upper jaw, as suggested by Maisonneuve, and thus effecting a broad entrance to the lateral aspect of the base of the basilar process. This operation, though a good one for large tumors, would involve an unnecessary disturbance of the parts in the present case. Vallet's operation also did not seem advisable, though in it less destruction of the bony parts took place, with an efficient lateral exposure. The speaker, therefore, in this instance, as the roof of the mouth was a wide one, determined upon that devised by Nelaton, which consisted in cutting through the soft palate, then removing a large portion of the hard palate along with part of the vomer. [This was demonstrated upon a skull, as was also bony sections of Vallet and Maisonneuve.]

This method exposed the basilar process and nasal fossæ completely, and was, he thought, best adapted for removal of tumors of moderate size. It had been done, according to Robin-Masse, seventeen times with only three deaths. This as well as the other operations were divised with the idea of having a permanent opening leading to the basilar process. The osteoplastic operations should not be entertained by the surgeon, because of the well-known tendency of such tumor to return, which demanded a number of secondary operations often extending over years.

*Second.*—The second point was that regarding the advisability of doing a preliminary tracheotomy.

The speaker had studied the question carefully, and had finally concluded not to do this. In Dr. Sand's case, however, it was not done, and the hemorrhage was easily controlled, and trachea saved from blood intrusion by keeping the head well forward, with the patient only under partial anæsthesia. This plan was somewhat troublesome, but

effective. In Dr. Peters' case it was done with a satisfactory result. Notwithstanding this, Dr. Weir was influenced in his decision in part by his belief that tracheotomy was not the comparatively safe operation often supposed. He had found in support of this view that, in ninety-three cases of tracheotomy performed for the early removal of foreign bodies in the air passages, there had been twenty-six deaths. On the other hand, however, the risk that accrued from blood entering the trachea, etc., was not to be statistically estimated. He believed now that his decision not to perform tracheotomy was an error of judgment. This would be apparent from the details of the operation, which were as follows:

The patient was anæstheized and the head thrown strongly backward over a hard pillow (Rose's position) so far that blood would not run into the trachea, and supported on a sand-bag. The operation was then begun, with the mouth held open by Dr. Weir's mouth-gag; the soft parts of the hard palate were cut in the median line and stripped from the bone, and the latter divided with a chisel on each side from the level of first bicuspid tooth and transversely at this point, so that a space nearly an inch wide was made, affording a complete view of the tumor antero-posteriorly, with no difficulty except quite free venous oozing, some which came from a wound of the tumor itself.

At this moment the patient suddenly began to gasp and choke. The speaker could not say whether blood had been sucked into the trachea or not. The asphyxia was so great that tracheotomy was at once performed with a single cut, a tube inserted, when the patient revived. Dr. Weir, however, noticed, when he performed tracheotomy, what he considered an important fact in connectian with Rose's method, and which a subsequent experience, in two other operations in which the plan was adopted, has confirmed, that the trachea was so stretched that the anterior and posterior walls were very close together, and in the first incision the posterior wall was nearly cut through. It seemed to him, therefore, very probable that this stretching and compression of the trachea, more possible in the young subject, had something to do with the bad symptoms.

The tumor was then readily removed without any difficulty and without much loss of blood. The child was, however, much prostrated, but rallied, and at the close of the cauterization of the narrow attachments of the tumor, was apparently doing well. He was then removed to the ward. In a few moments word was sent up that the child was sinking. Death occurred so suddenly that arterial transfusion, which was contemplated, could not be resorted to. The tumor was attached at the usual place of such growths, on the basilar process. It measured $1\frac{7}{8}$ by $1\frac{3}{8}$ by $1\frac{1}{4}$ inches, and weighed 17 grammes, or over half an ounce. Dr. G. L. Peabody, pathologist of the New York Hospital, pronounced it a fibro-sarcoma. It had a few mucous cells, and probably originated as a myxo sarcoma.—*Practitioners' Society of N. Y., in Med. Record.*

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## *Pennsylvania State Dental Society.*

The Fourteenth Annual Session of this society will be held July 25th, 26th, and 27th, at Williamsport, Pa. Arrangements have been made with the rail roads by which tickets can be secured at reduced rates, by presenting orders obtained from the Corresponding Secretary. The Park Hotel has reduced its figures from three to two dollars per day, to guest attending Convention.

Williamsport is delightfully situated on the North branch of the Susquehanna river, 70 miles North-west of Harrisburg, and is 900 feet above the sea; surrounded by some of Pennsylvania's finest mountain scenery, making it exceedingly picturesque, and with health giving atmosphere makes it an exceedingly pleasant resort.

The following programme has been prepared by the executive committee:

*Essays.*—President's address, C. B. Ansart, D. D. S., Oil City. "Lesions of the Alveolus," N. E. Magill, Erie. "The Influence of Constitutional Defects upon Dental Tissues," by C. S. Beck, M. D., D. D.S., Wilksbare. "Nervous Force and Nervous Lesions" illustrated by vivisections, by N. C. Barrett, M. D., D. D. S., Buffalo. "What Constitutes Success in Dental Practice," by D. T. Nay, D. D. S., Bedford. "Reaction of Den-

tine with Special Relation to the Combination of Gold and Amalgam in Approximate Cavities," by H. C. Register, M. D. Philadelphia "Adjusting Artificial Crowns to Roots of Natural Teeth," by W. H. Fundenberg, D. D. S., Pittsburg.

*Demonstrations.*—"Pivoting all Porcelain Crowns," by N. G. A. Bonwill, M. D., Philadelphia. "Pivoting Weston's Crowns." "The Application of Gold and Amalgam in Combination," by H. C. Register, M. D., Philadelphia.

Baltimoreans can secure excursion tickets by presenting orders at the following Stations, Union, Calvert, and Corner Baltimore and Calvert Sts.

W. H. Fundenberg,

Pittsburg, Pa. *Corresponding Sec'y.*

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## *Pittsburg Dental Association.*

The 8th, Annual Meeting of the Pittsburg Dental Association was held May 9th, 1882, at the office of Dr. Fundenburg, 323 Penn Ave. President Dr. W. F. Fundenberg presiding. By amendment the time of meeting was changed from 2nd, Tuesday to 2nd Thursday of each month. The following officers and delegates were elected for the ensuing year;

*President.* Dr. H. Manchester.

*Vice President,* Dr. J. Goshom.

*Secretary,* Dr. W. H. Fundenberg.

*Treasurer,* Dr. C. E. Diehl.

*Delegates to the American Dental Association,* Drs. F. A. Reinhart, F. Deterding, A. H. Greenawault, D. C. Phillips, and N. H. Fundenberg.

*Delegates to Pennsylvania State Dental Society,* Drs. J. Goshom, C. W. Beacom, F. A. Reinhart, Reineka and F. Troth.

Adjourned to meet 2nd, Thursday of September, 1882,

W. H. Fundenberg,
*Secretary.*

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## *American Dental Association.*

The Twenty-second Annual Session of the American Dental Association will be held at Cincinnati, commencing Tuesdsy August 1st, 1882.

Geo. H. Cushing, *Rec. Sec.*

### *National Dental Association of the United States of America.*

The next meeting of the National Dental Association of the United States of America will be held in Washington, D. C., in the lecture hall of the National Museum of the Smithsonian Institution on the 3rd, 4th and 5th of August, 1882.

The meetings of the Association in Washington are quadrennial and international. A cordial invitation is extended to all members of the Profession in this and other countries to be present at this meeting.

R. FINLEY HUNT. D. D. S., *Sec'y.*

### *Southern Dental Association.*

The Fourteenth Annual Meeting of the Southern Dental Association will be held in the building of the Baltimore College of Dental Surgery, Corner of Eutaw and Franklin Streets, Baltimore, Md., commencing Tuesday, August 8th prox. A cordial welcome is extended to all dentists to attend.

E. S. CHISHOLM, *Pres.*
W. H. HOFFMAN, *Sec'y.*

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# EDITORIAL, ETC.

*The New Building of the Dental Department of the University of Maryland.*—This structure is rapidly approaching completion, and will be ready for occupancy by the middle of July next. It is constructed of brick with fourteen-inch walls two stories in height and situated on an elevated site in such a position that there is unobstructed light on every side.

The entire building contains *forty-nine* windows independent of the doors; *twenty-five* of which are in the Dental Infirmary, rendering it the most complete and best lighted hall devoted to such a purpose in existence. It is the only Dental Infirmary and Laboratory Building that has ever been constructed for such uses; hence every care has been taken to make it as com-

plete in all its appointments and conveniences, both as regards location, position and arrangement as was possible. The extensive grounds of the University rendered the selection of a site which would be best adapted to such a purpose, a matter of choice only. On the first floor is the extensive Dental Laboratory, the Extracting Room, Impression Room, Wash and Water Closets, Closets for Instruments, etc. The Dental Infirmary occupies the entire second story, in which there is not even a column, being one unbroken hall, sixty feet long by thirty feet wide, and capable of accommodating some fifty or more dental chairs.

In addition to the large amphitheatres and lecture rooms of the Medical Department, in which the lectures to the dental students on Anatomy, Surgery, Materia Medica, Physiology and Chemistry will be delivered, there is a large Lecture Hall devoted to purely dental lectures, containing elevated seats capable of accommodating hundreds of dental students.

The arrangements throughout of this Dental Institution are, beyond doubt, more complete than those of any other in existence; and the prospects for a successful beginning are most encouraging. It is universally acknowledged that the advantages offered dental students by the Dental Department of the University of Maryland far excell any within the power of separate dental schools. And as the University of Maryland was organized in 1806, its dental diploma will bear a date *thirty-four years older* than that of the oldest seperate dental school. Besides, the high reputation which the diploma of the Medical Department of the University has always born, cannot fail to render its dental diploma equally valuable, and assure its recognition in foreign countries where the diplomas of separate dental schools are now denied recognition, as in England and Germany, for example.

It is also safe to predict that in a few years hence, separate dental schools will have become extinct, and dental education be conducted solely within Medical Universities, where it properly belongs, and where it can be more perfectly pursued.

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*The Baltimore College of Dental Surgery, Its Past Present and Future*—The catalogue of this College is in the hands of the printer at this writing, announcing the "Forty-third regu-

lar course of instruction," to begin October 1st, 1882. It is a subject of congratulation that this institution, now becoming venerable in dental education by comparison with others, stands on a firmer basis than ever before. Whether this is due to the infusion of new blood or, as we trust we may state with becoming modesty, a growing recognition of its solid merits, its friends may judge; but as the past two years have been years of unexampled prosperity we feel that congratulations are in order.

In the forty odd years that have passed since Chapin A. Harris organized this school, many changes have occurred. Death has taken the founder, with Handy and Bond, Piggott and Austin, Noel and Howard, while others have gone to take positions elsewhere. It is felt that these vacancies are satisfactorily filled; and that the "present" of the old college will not compare unfavorably with the past. Its prestige, museum, building and apparatus for teaching remain, and although the writer may not say it of himself, certainly no more earnest students or intelligent intellectual men remain connected with any college than his compeers. It is due to some of these, that the steps forward and upward in dental education, which others have copied and still others are copying, have been taken. And we are sure that the active brains and resolute determination of these men who are throwing their weight into this effort to improve the Baltimore College will accomplish much now in the future.

Never, we feel sure, has the "old college" stood on a firmer basis; never has it seen its future so clear for usefulness; never have its hands been so untrammeled. And we ask of its friends with confidence, to study the results. Mark the young men who go out from its halls, contrast them with those of the past, for *results* are the true tests of all such things,—and we are willing to abide the verdict rendered on this evidence.

The man nowadays who does not hold his opinion of things in a plastic state, ready to mould them to new revelations, is unwise, and especially is this the case with dentistry. We recognize this, and are from time to time instituting such additions to our working force and to the management, as we feel will help the young to a thorough education, and, at the same time protect the public. With this end in view, *open examinations* were established; and this school is the first Dental College which has dared to do this. Certainly no Faculty would dare

graduate students unworthily in the presence of impartially selected men; and certainly no honest men would suspect the Committee of the Board of Visitors of sinister action.

And *graduation on merit* is, we are bold to say, more prominently a feature of the "old school" than of any Dental College in existence. No dental school seemed able to break away from the tradition that any man could learn dentistry in two years, and that no man could learn it in less, until the "old college" set the example. It is a proposition which commends itself to the common sense of every man, in every-day life; and yet, having gotten in to the rut made by our colleges, generally it seemed impossible to get out. And now from all over the country come words of "well done," "good," "the right thing," etc., etc.

The writer is on record as ready to "step down and out," so soon as the "coming man" is found; it matters not and he wishes so earnestly the good of the "old school" that he has no friends to make or lose in comparison with that desire. And if he never writes another line for this old JOURNAL, or delivers another lecture before the class of the "Old" Baltimore College of Dental Surgery, he asks of all its friends a candid, fair and, so far as can be, personal examination into its merits as a school. We invite investigation into our record, our methods of teaching, and our facilities for this; the quality of the men we graduate, and the advantages we offer.

J. B. HODGKIN.

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*Southern Dental Association.*—We again call the attention of the profession to the coming meeting of this Association in Baltimore on the 8th of August next. From many points come letters stating the intention of the writers to be present, and a useful and pleasant meeting is anticipated. One point we wish to correct. It is intimated by a letter writer that this is an Association promotive of a continuance of sectional animosity. Not so: This is a big country, and can hold many Associations as large as the Southern Dental and American Dental; and as the latter usually holds its meetings not far from the Canada line, the Southern Dentists should have an Association meeting in such localities that they can attend it at a reasonable cost of time and money. The Southern Dental was in the foremost rank in the formation of a national Association, which is broad

enough and liberal enough to receive all reputable dentist, of whatever locality or shade of belief.

J. B. HODGKIN.

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# BIBLIOGRAPHICAL.

*Manual of Dental Surgery and Pathology.* By Alfred Coleman, L. R. C. P., etc., etc., etc. Thoroughly revised and adapted to the use of American Students, Practitioners, by Thomas C. Stellwagen, M. A., M. D., D. D. S. Publishers: Henry C. Lea's Son & Co., Philadelphia.

The reviser deserves the thanks of the profession for the labor he has bestowed on this work to adapt it to the wants of the American practitioner and student. Twenty-three Chapters embrace First and Second Dentition, Injuries of the Teeth, Dental Caries, Description of Instruments, Treatment of Dental Caries, Periodentitis Necrosis, Artificial Crowns, Extraction. Anæsthesia, Replantation and Transplantation of Teeth, Diseases of the Gums, Jaws, Antrum, etc., etc.

Like all English works on Operative Dentistry, its chief fault is a failure to fully describe some very important operations; such as restoration of contour, use of the electro-magnetic mallet, etc., etc.

The article on pivot crowns is excellent so far as it describes a limited number of modes of application, but there are others of value which have been altogether omitted. This Chapter is the work of the American reviser, and is well written and comprehensive. The revisor's method of "Capping" by means of the chips and powder cut from the healthy dentine of the tooth being treated, is given in full and his preference for such a protective covering clearly shown. The use of arsenious acid as an antiseptic in dead teeth is not a wise recommendation in our opinion, and should be resorted to with great caution, if at all. In the diagnosis of diseases of the periosteum, the work lacks the conciseness so necessary in classification of causes, &c., which should form one of the leading features in all descriptions of pathological conditions. We are aware of the difficulty of revising a work and at the same time preserving

the identity of the author; hence Dr. Stellwagen deserves great credit for the manner in which he has arranged and annotated this publication. We have no doubt but that the reviser would have found it an easied task to have written a work entirely his own. It will prove, however, a valuable addition to dental literature, and is well worth some study. The neat and handsome style in which it is issued is worthy of the well known publishing house from whence it comes.

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*A Manual of Dental Anatomy Human and Comparative.* By Charles S. Tomes, M. A., F. R. S. Second Edition. Publisher: Presley Blakiston. Philadelphia.

It is with pleasure we note the publication of a second edition of this excellent work, which has been entirely revised, and partly rewritten. Many new illustrations have been added until the number in the present edition has reached 191 The chapter on the dental tissues has been altogether revised and its value greatly enhanced. So valuable is this work, that German and French translations have been rendered, thus placing it within reach of all dental practitioners,

Its value as a text book cannot be overestimated and it is highly appreciated wherever it has been introduced. The style in which it appears is very creditable to its American publisher.

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# MONTHLY SUMMARY.

*Dental Surgeons in the Army and Navy.*—A movement is on foot aiming to secure the appointment of dentists in the army and navy. It is understood that a bill for this object will be presented to Congress at its next session, and that the subject is to be brought up at the meeting of the American Medical Association in 1882.

The need of dental services in the army and navy was first urged some thirty years ago. The matter has been twice laid before Congress since then, but without any action being taken. A dentist has been appointed to the Naval Academy at Annapolis with the rank of Assistant-Surgeon, and this is, we are told, all that has been done in the matter.

The want of dentists for our soldiers and sailors is very apparent. Sound teeth are one of the physical requirements for service, and it is only right that opportunities for preserving the teeth should be given.

On sea-voyages and in Western service it is quite impossible, as things now stand, that there should be any way of treating diseased teeth except by extraction. The testimony of many of the medical staff of the army and navy, as given in the *Times* recently, is to the effect that the need of dentists is much felt.

There are a number of practical difficulties, however, in the way of creating and furnishing these services.

We have an army of only twenty thousand men scattered in small garrisons throughout the country. It would hardly be feasible to appoint a dentist for each garrison, and the dental surgeon would have, therefore, to be a rather expensive itinerant. In the navy the difficulty would be still greater. In both branches there would, no doubt, be considerable opposition to admitting dentist to equal rank with medical men. For dentist have no right to call themselves medical or surgical specialist, unless they have gone through the same kind of education and training as that to which the gynecologist, laryngologist, or oculist subjects himself.

There is no doubt, however, that dentist are often needed and would be most useful in both army and navy. We should be glad to see the obstacles in the way of the introduction of their services there overcome.—*Medical Record.*

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*The Therapeutic uses of Nitrite of Amyl.*—Dr. Edgar Kurz, of Florence, has found his medicament so useful in the various aches and pains of every-day life that he has persuaded many families of his aquaintance to keep it on hand as a domestic remedy. It is an excellant external application for stomach-ache, colic, toothache (whether nervous or arising from caries,)

neuralgia of the trigeminus, of the cervico-brachial plexus, etc. It is superior to anything else when inhaled in so-called angio-spastic hemicrania, giving rapid relief in the individual paroxysms and prolonging the intervals betweeen them. No trial was made in case of angio paralytic hemicrania, since in this affection the drug would be physiologically contraindicated. It has a very good effect in dysmenorrhea, especially when occurring in chlorotic girls. In mild cases external applications suffice, otherwise the drug should be inhaled (when complicated with inflammatory conditions of the uterus or appendages, the results were doubtful or negative.) It was found to be of much value in attacks of dizziness and faintness occurring in anemic individuals, as also in a fainting-fit from renal colic, and in several cases of collapse during anesthesia by chloroform. It has been recommended in asphyxia from drowning, hanging, and in asphyxia of the new-born. But the first indication in these cases is the induction of artificial respiration, after the succesful initiation of which inhalations of nitrite of amyl doubtless assist in overcoming the concomitant spasm of the smaller arteries. One of the most important indications for the use of the drug is threatening paralysis of the heart from insufficient compensation. In such cases it is necessary to gain time until digitalis and alcoholics can unfold their action, and here nitrite of amyl stands pre-eminent.—*London Practitioner.*

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*A New Fungus.*—The *Gazette Medicale* states that M. Pasteur has found an organism in the blue and green discolorations which are sometimes seen on old surgical bandages, which preserved through many cultivations the same characters and properties. It consists of colorless gloubular cells, from 1–1000 to 5-1000 of a millimeter in diameter, and has the power of secreting a pigment, which may easily be dissolved out by chloroform. The blue, or pyocyanine is reddened by acids, and restored by alkalies. Dissolved in a weak acidulated solution, neutralized by potash, and treated again with chloroform, pyocyanine yields a pure blue liquid, from which, after evaporation, it appears in the form of crystals, sometimes as prisms or matted needles, at others as rectangular plates. The watery solution of pure crystalline pyocyanine is neutral, and is unchanged by boiling.—*Medical and Surgical Reporter.*

*Therapeutic Effects of Oxygen.*—M. E. Hagen, in a report to the Academy of Sciences. gives some facts regarding the physiological and therpeutical effects of oxygen. It is taken in doses of forty to ninety litres per day, in two doses, and mixed with a very small amont of air. It augments the appetite, slightly elevates the temperature, accelerates the circulation, temporarily increases the red corpuscles and the hæmoglobim in the blood and increases the weight of the body. It stimulates the nutritive movements of the tissues, and increases thereby the excreton of the urea. In chlorosis it is a useful adjunct to iron It stand and acts much in the same way that hydrotherpy does. In vomiting it is especially valuable. After one or two inhalations vomiting will generaly stop permanently, if it be not due to organtic disease. Vomiting is relieved by oxygen when due to painful dyspepsia, dyspepsia with dilatation, vomiting of pregnancy and uræmia.—*Cincinnati Medical News.*

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*A Triumph of Dentistry.*—At the last meeting of the Medical Society at Strasburg, reported in the *Medical Gazette* of Strasburg, Dr. Julius Böckel presented, in the name of M. Sauval, dentist, a lady for whom the latter had extracted a small molar tooth for dental caries with violent pain; and, having found it slightly carious to the bottom of its root, he sawed off the points of the root, filled it with gold carefully through the carious channel, and then re-implanted the tooth. The lady was free from all her pain; the tooth re-established itself solidly in her mouth; and at the date at which she appeared at the society (three weeks after the operation,) the tooth served for mastication as well as her other teeth. This is certainly a remarkable example of what is technically described as dental autoprothesis with aurification.—*British Medical Journal.*

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*College Examination for the Degree of Doctorate.*—Dr. J. G. Meachem, of Racine, Wis., thinks that independent examining boards for graduates are not needed, and that the medical faculties of the several leading colleges are the best judges of the qualifications of candidates.—*Medical Record.*

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# ARTICLE I.

## *Pericementitis.*

ITS MANIFESTATIONS IN THE ORAL CAVITY, AND ITS SERIOUS EFFECTS UPON THE GENERAL HEALTH.

BY G. A. MILLS, D. D. S.

[From Proceedings of the Medical Society of the County of Kings, N. Y.]

Pericementitis, its manifestations in the oral cavity and the serious effects upon the general health, is considered by me of great import to the public whom we are called upon to serve, and certainly should be so considered by us as guardians of the public health. This is the purpose I have in appearing before your body to-night, that I may present to your intelligence, facts that will awaken your co-operative interest by taking cognizance of the prevalence of this destructive disorder.

While I fully recognize the fact that the department of the healing art, of which it is my pride to be a member, is a specialty of the general body, yet I am fully aware of another fact—as you doubtless are—that the attention of the oral cavity, comprising the teeth and their allied structures, has been, in the eariler times, so unnoticed that

it created a necessity in the animal economy for the branch or specialty which I represent; and yet while we have the recognition of an unparalled progress, strange it may seem when I acquaint you with the incontrovertible truth that we have not been able to meet or stay the tide of this cyclone of destructiveness, as yet, to any considerable extent, while the part that has called into action the mechanical ability, has matured into a high degree of excellence. And now the department of education that presides over the culture of surgical ability is being recognized as *the* important factor and requisite to cope with those of a larger range of cultured ability. So fast as this shall occur in individual or aggregate cases, there will be but one mind regarding the appropriate recognition of fraternal counsel.

The subject which I come to speak to you of is not a new one; it may be, for aught I know, as old as disease itself. It has not been an unnoticed one either, in the general literature of the healing art; it has been characterized under a variety of nomenclature, with which you are more or less familar. So far as my understanding has reached, it has been generally considered as the result of advanced age, and doubtless, for this reason, that the expressions have been the more generally noticed because of the advanced condition so prevalent at this stage of life; while, on the other hand, with the light we now have, it is clearly shown that the mass of cases have their beginnings in early life, and because of the untrained perception, the minor expressions have failed to gain the notice they now prove to be worthy of. Bleeding and sponginess of the gums and the accumulation of lime, so-called tartar, have been lightly taken into account, and therefore as lightly dealt with, being met simply with some feeble astringent, or by the semi-barbarous operation of scraping or scaling the teeth—of which some of you may still retain a vivid recollection. This being slightly considered, it was found necessary to repeat this inquisition with frequency, and with

little, if any benefit, beyond the comfort of the external surroundings of the teeth and gums; but further on, as a larger indentification of complications with personal discomforts associated, the interrogation has been not uncommonly put: "Why this state of affairs? And is there no remedy?" And as often received the almost stereotyped answer: "It is not amenable to successful treatment," while untold suffering has accrued, and the loss of thousands upon thousands of teeth that were yet untouched by the disintegrating process of caries. We have often, also, after our best and perfected operations by fillings, been obliged to acknowledge that these efforts were not enough to prove the highest efficiency of our calling; for, did it profit anything to be able to save the tooth, and, after all, the socket be swept away by disease? Fortunately, out of every great emergency there always seems to be provided some Moses to lead into a larger freedom.

This brings me to a point in this paper which will go into history. I now call your attention to facts that you may not be particularly familiar with, and which will serve to answer the question why this subject has come so persistently and hopefully to be considered during the few later years. I hold this particular feature of this paper to be so pertinent and just, that I cannot withhold its introduction. To Dr. John M. Riggs, of Hartford, Conn., is due the credit of the revival of interest in this subject; a gentleman of no ordinary culture, both of A. B. and M. D., and one who has no peer, in my estimation, in his State, as a true professional man. He has been for some forty years an earnest investigators of the practical details of office practice. His characteristics being somewhat peculiar to himself, he did not come to the arena of discussion in our calling so readily as others, and therefore we did not get the benefit of his observations. in this direction so soon as we might otherwise have done. And yet it may be that he came in due time. It may not detract anything of interest to state that Dr. Riggs was the gentleman associ-

ated with Dr. Wells, of Hartford, in his experiments with nitrous oxide gas, Dr. Riggs extracting from Dr. Well's mouth a tooth, it being the first operation of this nature under the effect of an anæsthetic ever made. To use the words of the doctor himself, he says: "This disturbance, under consideration, early enlisted his attention," and he came to know that he was meeting with an increasing success beyond that, which he discovered, of his fellow practitioners, and did occasionally drop into limited conversation regarding it, so that it came to be known that he was pursuing a line of treatment not general, if at all known of, by the profession of dentists.

Dr. Riggs' public announcement of his views created no little credulity and curiosity, they being entirely new and different from anything then incorporated in the general literature. He claims to have found it necessary not only to remove the external deposits about the necks of the teeth, but at a certain stage of the disease to follow on to the margins of the process and trim away that portion that had become a foreign body by inflammatory action, instancing it as a principal recognized in general surgery (*i. e.*,) to cut back to the life line or into it, and thus establish a healthy action.

I will say, in passing, that human nature is quite the same in our department as in others, and the matter was quietly waived aside by some and vigorously attacked by others—I refer to the older members. Counter claims for originality were put in, but time has not evidenced the truth of them; and I do not hesitate to say that the truth of Dr. Riggs' claim had been fully established to the minds of all fair-minded men who have been cognizant of the discussions that have taken place.

The outcome of this has been the origin of the nomenclature "Riggs' Disease," which has become so familiar among us. Dr. Riggs' has, as a result of his attention to this subject, devised a set of instruments for treating this disease, so constructed as to be fully able to search out the

disturbing points, thus producing results which warrant the saying that it is a surgical operation of no mean order, and one that cannot be familiarized without extreme care and intelligent training. A novice can do much harm and afflict his patient severely, while the trained hand, presided over by an intelligent mind, can become an alleviator of great suffering and bring much physical harmony out of decided unhealth.

This subject did not gain the attention of our national body until the session of 1877, held in Chicago. In 1876 and 1877 I published a series of six articles in the *Cosmos*, under the title of "What I know about Riggs' Disease." These articles have been very extensively circulated and favorably commented upon in this country and foreign ones. Following these articles, Dr. Rehwinkle, of Chillicothe, Ohio, an able writer, presented an article to the national body entitled Pyorrhea Alveolaris, meaning the pus-discharging sockets, and has also been defined as catarrh of the gums. Before this body the subject was largely and ably discussed by many of our best men, and since that time it has received more or less attention throughout the societies of our specialty, and, as you are aware, occupied a place among the subjects at the International Congress held at London. There it was brought forward under the title of "Premature Wasting of the Alveolar Process." Dr. Riggs was present and engaged in the debate. During the last year the subject was taken up by the Odontological Society of New York City, being introduced by a paper, the product of Dr. Niles, of Boston, a graduate of the Harvard Dental Department, and was christened under the title "The Calcic and Phosphatic Diathesis of Odontolithus." Extensive discussions followed the paper, and both the discussions and the paper may be found in the published proceedings of the society. I have felt that I could not be faithful to this subject without giving some idea of the difficulty and opposition that has encountered a matter of such vast interest and importance,

but the cheering thought brings encouragement to those who have labored devotedly to place this matter in its proper position and to enlarge its sphere of usefulness in the alleviation of human suffering.

### PERICEMENTUM PERICEMENTITIS AND ITS HISTOLOGICAL FEATURES.

To Dr. C. W. F. Boedecker, of New York City, we are indebted for the ablest paper upon this subject yet furnished us. It is the product of faithful observation made by actual work with the microscope in the laboratory of Carl Heitzman, and furnishes us an understanding of this subject that makes the way quite plain. These articles can be found in the *Cosmos*, and will be profitable reading to any who may feel an interest in the matter.

As it is not my purpose to environ this paper with any extended details upon the scientific aspect, I will not enter largely upon its histological features, only noting the fact that they are comprised within both the myoxomatous and fibrous connective tissue series, the former in the early life and the latter more advanced. This will account for the variable associations of discomforts between the early and later disturbances, the former attended with a less degree of pain; and yet, under favorable circumstances, a greater rapidity of progress is made, for the reason that the one is endowed with less resistance than the other

Pericementum has a connection of continuity both with myxomatous, or gum tissue, and the periosteum. By being so allied to the cementum, a continued disturbance of the periosteum results in the complication of the disease, and the destructiveness not only of these but also the osseous portions forming the socket.

Pericementitis is an expression of a greater or less degree of debility resultant upon nerve degenercy. It has a variety of phases, yet is more generally manifested at the peripheral margin of the gum. This is characterized sometimes by slight tinge of congestion, changing the appearance from a normal, pinkish color to one of deeper red or

purple, and at others to an anæmic or bloodless, or colorless appearance. This is followed by a detaching, or relaxing the constriction of the membrane about the neck of the tooth. This is followed by the appearance of foreign substances, or by the absence of them, and an extended detachment of the tissues about the whole or part of the neck of the tooth. The character of the inflammation—be it acute or otherwise, destructive or less so—is determined by the constitutional powers of resistance or the opposite. By this, I mean if there is a quantity of power to aid in the producing of the *quantum sufficit* of such equality of proportions to establish a normal status of repair; or if it be equal in one and deficient in another, these must necessarily be so overpowered as to result in an overplus of disturbances of territory, the weak succumbing to the strong. This may be the awakening of the bond or bonds of energy in a normal degree, but yet being met by a bond of enfeebled affinit the results can only be destructive in a greater or less degree. Hence the necessity of something in the supply of nutriment that will be adapted to restore the enfeebled bond to its normal power of requisite affinity, so that the equality of waste and repair may be normally adjusted. This statement may or may not seem somewhat obscure, but my belief is that when the *modus operandi* of inflammatory action is understood, it will then be made possible to accept this. The time has, in a large measure, arrived for the physician of the future to establish the fact that his mission is of prevention rather than cure. We, in our investigations, look for exciting causes. To say that I am fully prepared to answer at this point would possibly seem quite like assumption. Many views and theories are advanced. Some attribute the cause to the presence of deposits of lime and their mixtures (so-called tartar.) Some claim that these are the results of inflammatory action, and still others call them sanguinary deposits, or residuum of the broken down tissues, blood, etc. Now I cannot accept any of these views as the *cause* of the dis-

ease. The *cause* is *in esse.* By this, I may mean, or will so express as a general term, nerve degeneracy. This gives rise to the question of definition for that. These questions all give rise to the acknowledgment of the impossibility of meeting all the points except upon the knowledge of the organization of tissues. As yet we know but in part, but we are accumulating a few postulates as the results of cultured discriminations as they are now being read from the work of nature through the microscope. And by this we may reasonably hope that the time is hastening when we will be able to throw aside the curtain of mystery and reveal the deductions. While I have referred to the more general manifestations of this disease, I have not noticed that there are many exciting causes, viz., mechanical irritations, dead pulps, alveolar abscess, crowded conditions of the teeth, accumulations of foreign substances, etc., etc. Not a few cases manifest a peculiar phase, noticed particularly associated with the exhibit of a recession of gum tissue and not any inflammatory action apparent. These are denominated atrophy of the gum. It is thought by many to be caused by friction of the brush. While this might, under some circumstances, facilitate the loss of tissue yet it is far from being the cause. This phase is seen at points where the brush would fail to have any such effect, viz., not only on the labial and buccal, but on the lingual and palatal surfaces of the teeth; and I would add that in many of these cases there is no perceptible presence of deposits of lime.

You will notice that I have, in passing, pointed out the manifestations of the disease in their mildest expressions. Starting out with the familiar adage that prevention is better than cure, it becomes of decided importance to emphasize familiarity with incipient stages, for if intelligence is active at this stage, we have under control the staying of its future destructiveness. The *serious* effects of this disease upon the general health are so well known to those who have familiarized themselves by an earnest and vig

orous study of its workings, that it would be a crime to sit in silence and not proclaim the agonies associated. I am satisfied that large numbers are being cut off from their pilgrimage here prematurely, while thousands are dragging out a drooping existence of lassitude, depression and inanition directly and indirectly traceable to this disease. Perhaps I cannot do better than to state a case which will serve the purpose of demonstrating the many.

In the fall of 1878, Dr. Mason, Sr., Pres't. of the Long Island Medical College, called at my office and consulted me about a patient of his who was in a wretched and rapid state of decline of health. He said he and his son had exhausted their remedies upon this patient, and he, having seen my articles published in Brochure, had become impressed that possibly this patient was a victim to the disease I had called his attention to. Several dentists had been consulted, but not with encouragement, excepting the extraction of the teeth. The patient came into my hands. She was about thirty-eight years of age, strong, nervous-bilious temperament, married. I found her with a dry, parched skin, feeble pulse, loss of appetite, depressed—sadly—sleepless, nausea on waking in the morning, and great loss of nerve energy. She had twenty-nine beautifully formed teeth, so loose that she had not been able to masticate with any power for a long time—some two years I think. From every socket was exuding a fetid discharge and very copious, so much so that she was obliged to place two large napkins under the side of her face to receive this flow at night while she slept. Now, this case did not prove to be one of suppurative pericementitis alone; it had involved the osseous formations, and that portion involving the sockets of the teeth was more or less destroyed. This case proved in treatment the necessity of surgical atttention in the direction claimed by Dr. Riggs, as I have described. It also proved that it had been developed altogether during the time she had been cognizant of it, but circumstances of such severity had fastened upon her and so checked the

activities of her organization that it was left with an enfeebled power to cope with the disorder already present. The patient being so highly organized, her sufferings were of the acute order, and played great havoc among the distributions of the sensory nerves. The result of the treatment in this case, both surgical and constitutional, brought the patient again into the sphere of activity and usefulness. To use her own words, "she was as good as new." The exciting cause of the rapid decline of this patient was a *terrific mental grief.* I could detail numerous cases that have come under my notice during the last eight years, particularly where a variety of associate disorders had become complicated. I do not need to pursue the enumeration of these facts. You are familiar with many instances where the progress of disorders frequently reveal before unknown ones, resulting in prolonged distress, and not uncommonly, loss of life.

And now I do not think I need go further, for I do not doubt that the intelligent mind will grasp a proper measure of the truths to which I have called your attention, and which are readily demonstrated in the oral cavities of ninety per cent. of the people, in a greater or less degree of activity. I will not leave you with the impression that the specialty I represent is wholly alive, or in a large sense cognizant of the nature or of the destruction that is traveling madly over their every-day practice. The importance of surgical ability, as I said in my introductory, is becoming to be felt as the advanced step necessary to bring this branch to its needed elevation for usefulness. As yet dentistry, as practiced by the masses, can claim to be no more than Webster gives them credit for: "one who repairs teeth." To my understanding dentistry has a distinctively separate line from oral surgery, and will, I predict, in the near future be so estimated by intelligent people of discernment,

Gentlemen, it is from your ranks that much aid can come to assist those that are zealously devoting their

energies to raise this special feature—oral surgery—to its sphere of greater usefulness in the alleviation of human suffering. And if you have been convinced, by what I have brought to your attention, of a conception of its importance, then I will have not spoken in vain.

The resume of this paper leads me to say this: that the revival of interest in this subject, by being brought up under a new feature, has proved aggressive, and by the controversy, interrogation by thought and action has given additional knowledge. It can no longer be viewed as a trival matter, for the fact is established that it is a specific disease, exhibiting specified manifestations and amenable to treatment, under the same limitations as all diseases; also, that trained perception and cultured discrimination, gained by concentrated investigations and practice, produce a grade of skill above that of the novice. Further, that the serious import of this subject to the public cannot be emphasized too strongly, for they cannot know too early that which is *first* our duty to become acquainted and impressed with, and in proportion as we come into possession of this knowledge, and are made conscious of its purpose in our hands, we will impress them by the alleviation of their sufferings. "He that hungers and thrists for knowledge, will, in the giving of it, unconsciously use it as a blessing and a joy to many."

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## ARTICLE II.

### *To the Dental Profession.*

A meeting of dental dealers and manufacturers for consultation upon the interests of the trade in dental goods was held in Pittsburg in February last. It was there decided to form a permanent organization, and this was consummated at a meeting held at Niagara Falls, June, 21.

Through a misapprehension of the objects of this association by some members of the dental profession, the fear

has been expressed that the intention was to combine for the purpose of raising prices, and in other ways to work injury to them.

It is the purpose of this paper to set forth the objects of the association, and to show that apprehensions of injury to the dentists by its operation are entirely unfounded.

Number 2 of the Articles of Associations sets forth the purposes of the organization, as follows:

"The objects of this association are to reform abuses; to secure unity of action; to promote a friendly intercourse between its members; to avoid and adjust, as far as possible, differences and misunderstandings between them, and generally to advance the interests of the trade in dental goods in the United States."

This article is an honest and full expression of the objects of the association. In their business relations the dentists, the dealers, and the manufacturers are a necessity, each to the others, and whatever really injures one class will eventually injure the others. Neither manufacturers nor dealers can legislate against the *true* interests of their customers without in the end injuring themselves.

The dealers in dental goods in this country have suffered for some years from wrong business methods. These have grown very largely out of a want of intimate acquaintance and intercourse, leading frequently to unnecessary and unwise competitions which largely increased expenses and losses by bad debts, and which, while benefiting a few customers, worked a positive injustice to many others.

Organization will tend to correct these evils, and by periodical meetings, intercourse, and discussion, information will be diffused, misapprehensions will be corrected, and the interests of all concerned will be promoted.

The dentists themselves long since decided that organizations with frequent meetings for the interchange of ideas and information are of inestimable value. It is believed that they will not be disposed to condemn, *a priori*, a plan for others which they have found so beneficial for themselves,

but that they will be willing to accord to the dealers, the privileges of organization without fear that the association will be used by its members against the interest of those who are in business their best friends.

The business of a dealer in detal goods must, of necessity be of a limited character,—very different from that of a dealer in dry goods, groceries, iron, or lumber; dealers in these articles have the entire population of the country for customers, while the number of *dentists* in the country is hardly more than twelve thousand.

One may be led to invest in luxuries for the table, in more fashionable garments, or more elegant furniture, without in any way reducing his *needs* for the future. Not so, however, with the business wants of the dentist; these are strictly limited to his practice, and if in any year he is led to buy more gold foil, rubber, teeth, instruments, etc., than his practice requires, his future purchases will be diminished in exact proportion. It is from forgetfulness of this fact, and from treating the wants of the dental profession as practically unlimited, that the wrong methods above referred to have mainly arisen, and they have wrought injury to both dealer and dentist.

I. The dealers have engaged very vigorously in a system of travelling far and wide which has added largely to their expenses without proportionately increasing their profits; in some sections of the country they have crossed one another's tracks continually, often to the great annoyance of dentists, who have too frequently been called from patients to wait upon canvassers. Some have been led to give away a portion of their legitimate profits in order to make sales, and with this has been the inevitable tendency to press the sale of inferior goods in order to keep up profits. Some have been persuaded to give unwarrantable credits, and thus to incur unnecessary losses from bad debts.

The tendency has been in the direction of increasing expenses, increasing losses, constantly decreasing net

profits, inferior quality of goods, and, in short, toward the degeneracy of the trade.

II. The dentists have been injured by this system in several ways:

1. It has wrought injustice to the many by the favors and concessions that have been given to the comparatively few. Cases were reported at Pittsburgh of three dentists in the same town, having the same kind of practice, yet each paying a differents price for the same goods; of a dentist who, by shrewdly setting three dealers to bidding against each other, purchassed his office-chair, etc., at nearly twenty-five per cent. less than his neighboring competing dentists were paying. It was shown that the dentist who had the most time to canvass among the dealers, or who could succeed in causing two or more dealers to bid against each other, and the dentist who lived on the routes most frequented by travelers, were the ones who received favors in price and credit: while the confiding one who ordered of his dealer without bargaining, in the belief that he would be as well served as any, the busy dentist who had not time to shop, and those not so frequently visited by canvassers, were charged full rates, and therefore, as compared with the others, were treated unjustly.

These irregularities have, it is true, been limited, though of late the tendency has been to extend them, and it is undoubtful true that far more than a majority of the dentists of the country have, by these practices, been placed at a disadvantage as compared with the minority.

The dealers' association proposes to correct this by adopting uniform rates for the same kind of goods, and treating all with equal fairness.

A schedule of discounts for large, strictly cash purchases has been adopted, and by giving all customers the benefit of it, the gross profits of the dealers will not be enhanced, and the dentists of the country, as a whole, will pay less for their supplies than under the old methods.

2. The competition on the road and the desire to do a larger business than is warranted by the nature of the

trade have been to the dentist fruitful sources of debt, that in many instances has proved burdensome and embarrassing.

The temptation of long credit as an inducement to buy large bills in advance of any reasonable wants has been freely offered. Many dentists have thus been burdened through promises from salesmen of a credit "as long as convenient"—promises which the principals have not known of or consented to, and the result has been misunderstanding and ill-feeling.

Believing that, as a rule, it is no kindness to the average professional man to induce him to incur debts beyond his needs for a moderate and reasonable time, the aim of the association will be rather to offer inducements for cash transactions than to endeavor to make sales by offers of unreasonable credit. It is believed that the relations between dentist and dealer will be strengthened, and that both will be benefited by this course.

3. The late methods of business have had the tendency to cause dentists on travelled routes to rely more upon travellers than upon their nearest local dealer. By encouraging him with his trade the dentist will enable his dealer to keep a better stock and to supply his wants as they arise, without the inconvenience of waiting for travellers.

One object of the association is to enable the dealer to supply his own local trade at as low a rate as any others can, and, of course, more promptly.

4. A far more serious matter to the dentist than those above referred to is the inevitable tendency of an eager competition for cheapness toward depreciation in the quality of the goods offered. It has been truly said that "a competition for cheapness and not for excellence of workmanship is the most frequent and certain cause of the rapid decay and entire destruction of arts and manufactures."

No inducement that can be offered in the way of lower prices can in the slightest degree compensate for such

depreciation. The greatest injury that can be inflicted upon the dentist, in view of the operations which he has continually to perform, is to supply him with inferior materials, appliances, and instruments. Most emphatically, in his case, "the best is the cheapest." There has been of late, as there must always be where a competition for cheapness exists, a tendency toward inferior goods.

The association will, indirectly, and yet surely, operate to correct this, and to place competition on the nobler ground of contest for excellence in quality rather than for cheapness in price.

The association is not a combination for the purpose of establishing a schelude of prices for dental goods. Differences in quality and in prices have always existed and will continue to exist. Any attempt to harmonize these differences would obviously be impracticable. The various manufactures of teeth, instruments, etc., will, as heretofore, make their own prices on their own products; but as manufacturers of dental supplies are also retailers, it is understood that whatever prices are established, or whatever alterations in prices are made, the facts shall be announced to the dealers, so that they shall have the privilege of selling as low as the manufacturer, and, on their part, it is understood that the manufacturer shall not be undersold on his own goods.

So far as prices are concerned, this is all there is in the organization. It does not make prices: it does not seek to control the manufacturers, nor to establish uniformity as to quality or price,—these points are left open to wholesome competition,—but it does seek to bring the dental trade to the one-price system *on the same goods*,—a fair and just system which, once established, will give assurance to each customer that he is paying the same price for the same goods that his neighbor pays; and that without loss of time or temper in canvassing among different dealers.

Such a system cannot fail to commend itself to all fair men.

In brief, the *American Dental Trade Association* hopes, by correct business principles and methods, by associated action, by social intercourse and business conferences, to be an attraction and a benefit to its members; and it desires, by careful attention to the wants of the profession, and a constant effort to aid in the progress of dentistry, by fair dealing, with every buyer, by an honest purpose to serve faithfully those who look to its members for supplies, by the assurance that the buyer who sends his order confidingly will surely receive as low rates as if he spent his time in bargaining, and that no competitor will receive special favors in prices, to commend itself to the confidence and esteem of the entire dental profession.

THE AMERICAN DENTAL TRADE ASSOCIATION.
J. LITTLEFIELD, *President.*
LEE S. SMITH, *Secretary.*

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## ARTICLE III.

### *Rights and Liabilities of Dentists at Common Law.*

BY JAS. G. DUNNING, L. L. B., OF THE SPRINGFIELD BAR.

The rights and liabilities of dentists in the practice of their profession are to be determined by the same rules that have been laid down for physicians and surgeons, and business experts in general.

A dentist is obliged in each case to apply such diligence as good dentists, acting under similar circumstances, would apply. The simple question is, did he in the particular case exhibit such skill and diligence as good dentists in such cases are accustomed to exhibit? When a man offers himself to the public as a dentist, the law requires that he be possessed of that reasonable degree of learning and skill which is ordinarily possessed by others of his profession who are in good standing as to qualifications. This rule does not require that he should have the highest skill, or

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largest experience, or most thorough education, equal to the most eminent of the profession of the whole country, but it *does* require that he should not when uneducated, ignorant and unfitted, palm himself off as a professional man, well qualified, and go on blindly in the duties of the profession.

But a dentist, qualified within this rule *may* be guilty of negligence and malpractice. The law requires and implies, as a part of the contract, that when a dentist undertakes professional charge of a patient, he will use reasonable and ordinary care and diligence in the case. The law implies that he agrees to use his best skill and judgment, but not that he shall possess the best skill and the best judgment. There is no doubt of the legal right of a dentist to refuse to take charge of a particular case. When in charge, however, he is liable for any negligence, whether of omission, or commission, which produces injury to his patient. But a dentist who is acting gratuitously, is liable only for gross negligence. An inexperienced volunteer, who acts when no expert can be obtained, is liable only for gross negligence. But if, by forcing himself into the case, he thereby excludes a competent dentist, his liability is the same as that of such competent dentist. If the practitioner, however, frankly informs his patient of his want of skill, or the patient in some other way is fully aware of it, the latter cannot complain of the lack of that which he knew did not exist. But no recovery can be had in any case where there has been no injury. The implied liability of a dentist retained to treat any particular case extends no further, in the absence of any special agreement, than that he will indemnify his patient against any injurious consequences resulting from his want of proper degree of skill, care, or diligence in the execution of his employment. And in an action against a dentist for negligence, or malpractice, the plantiff, if he shows no injury resulting from negligence, or the want of due skill in the defendant, will not be entitled even to nominal damages.

If a patient, refusing to adopt the advice and remedies of his dentist, or to follow his directions in any way, thereby frustrates the latter's endeavors, or if he aggravates the case by his misconduct, he cannot charge to the dentist the consequences due to himself. It is the duty of the patient to co-operate with his dentist; and if he will not, or under the pressure of pain cannot, his neglect is his own misfortune.

The rule has been stated to be that a dentist is bound only to exercise ordinary skill and diligence, the *average* of that possessed by the profession as a body, and not of the thoroughly educated only; that is, that he will satisfy the law's requirements if he possess the "average capacity" of the members of his profession. But the true rule seems to be not what the *average* of the profession would do, but what an intelligent, responsible and respectable member of the profession would do under the same circumstances. The average skill of the profession, taking in good and bad, young and old, as a mass, is hard to reach; and if we count into the aggregate the young who have had no practice, and the old who have retired from practice, the average would give a standard lower than that which should be required. Nor is this the only reason why the test of the "average capacity" is inadequate. In a city there are many means of professional culture inaccessible to the country. In a city new books and appliances can be promptly purchased, and libraries easily visited. In a city also exists that intercourse with prominent professional men which leads not only to keenness and culture, but to the free interchange of new modes of treatment. In the country such opportunities do not exist. What is therefore due diligence and skill in the country is not due diligence and skill in the city: and what is due diligence and skill in the city is not due diligence and skill in the country. Hence, the question of diligence and skill in each particular case is to be determined, not by inquiring what would be the average diligence of the profession, but what would

be the diligence of an honest, intelligent, responsible member of the profession in the position in which the defendant was placed.

The following case is reported in the 39th volume of the Maine Reports: Assumpsit for a ful set of artificial teeth for the defendant's wife. The contract was made with the wife with the knowledge and consent of defendant. When put into her mouth, she complained that they felt odd and pained her. The plate was then somewhat filed, but she still complained and declined to pay for them. It was agreed that she might take them away and return them on the following Monday, when she returned them and said she knew she never could wear them. Something further was done to the teeth, but she declined to pay for them and left them, although the plantiff forbade her doing so, and claimed his pay. There was conflicting evidence as to whether the teeth fitted her mouth. By one it was testified that they were a good piece of work, by another that they were a fair average piece of work, and by a third that they were nothing extra. Among other instructions the jury were told that "if the plaintiff had used all the knowledge and skill to which the art had at that time advanced, that would be all required of him." Verdict was for the defendant. Exceptions were taken to the above instructions by plaintiff's counsel, on the ground that they were misleading to the jury as implying that any less degree of skill would not satisfy the requirements of the law, and the full court held the above instruction erroneous as tending to hold the standard of professional requirements too high, and a new trial was ordered. In considering this case, the court said: "The highest degree of skill is not to be expected unless stipulated for; nor can it be reasonably required of all. If a dentist has used all the knowledge and skill to which his art had at the time advanced, no doubt that would be all required of him. But could so much be required of him? If it could, then every professional man would be bound to possess the highest attain.

ments, and to excercise the greatest skill in his profession. Such a requirement would be unreasonable."

A plaintiff in an action against a dentist for malpractice must prove that the defendant assumed the character and undertook to act as a dentist without the education, knowledge and skill which entitled him to act in that capacity, or, he is bound to prove that having such education, knowledge and skill, he neglected to apply them with such care and diligence as in his judgment, properly exercised, the case must have appeared to require; in other words, that he neglected the proper treatment from inattention and carelessness.—*New England Journal of Dentistry.*

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## ARTICLE IV.

### *Vacancies in the Dental Arch.*

BY W. C. WARDLAW, D. D. S

A single gap in the dental arch is often the fruitful cause of many evils. Chewing upon the opposite side of the mouth is, perhaps, the most common and greatest evil consequent upon one such vacancy. Where there are several, occasioning a positive difficulty in the proper comminution of the food, by reason of the sufficient articulation of masticating surfaces, then dyspepsia, with all its train of ills, is apt to follow. I know of no minor (?) operation in dentistry from which more comfort and utility is to be derived, than the filling of these breaks in the continuity of the arch, and that dentist who devises the simplest and most feasible method of doing this, will be a public benefactor and a humanitarian.

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It certainly is practical to fill the vacancy caused by the loss of one, two, and perhaps three teeth, by securing, through plugging, to the adjoining teeth, a bar of gold, to which has been attached by soldering, a porcelain crown

or crowns. The crown can be so nicely adjusted to the gum as to look well and natural, and if properly done, will be very stable and durable. It is a *nice* operation, and requires care and forethought, as well as skill and taste.

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I take, as my illustration of the crown to be supplied, the left upper first bicuspid. First, give attention to the formation of the cavities, which are to be prepared with more than usual care. They are supposed to be in the approximal surfaces of the canine and second bicuspid, and if no cavity of decay already exists, artificial mortises, or slots, will have to be cut in these positions. The thorough preparation of the cavities, and the taking of an accurate impression in plaster—not wax—of the parts, may be enough for one sitting, for both patient and operator. The entire operation would be too tedious, and this is a good half-way stopping place. Therefore fill the cavities temporarily with gutta-percha, or oxyphosphate, and dismiss the patient. From the impression, obtain a correct plaster model, upon which a large proportion of the work can be done without the necessity of the presence of the patient.

Having next carefully selected a crown—a cuspid crown would likely suit best—of proper shade, and ground to fit the gum nicely, solder on a gold backing. The backing may be prolonged a fourth of an inch, to rest upon the inside of the alveolar ridge This may be done by bending with the pliers, but really easier, by swaging up a small saddle to bestride the ridge, and to which the crown is to be soldered. This increased base not only adds greatly to the stability and permanency of the operation, but assists materially in steadying the crown and in keeping it in proper position during the operation of anchoring the cross-bar.

The next step is to make and attach to the backing of the crown a gold cross-bar of sufficient strength. This should be as long as the cavities in the teeth will allow, and should be so arranged relative to them that it will be sup-

ported on both sides, edges and ends, by the gold filling. Having so arranged all this by aid of the model, the two are to be soldered together, and all the crevices to be filled with solder or foil.

When the patient returns, the operation is to be resumed by preparations for keeping the cavities dry whilst they are being filled. For this purpose, I have used the wax ligature, passed twice around the tooth, but I find the rubber-dam better. It is not well to include both teeth in the same piece of rubber, for it is apt either to fold bunglingly in the way, or to exert a traction upon the crown so as to disturb its close adaptation to the gum. Begin, therefore, with the second bicuspid, and taking a small piece of rubber, cut a hole as near the edge—say one thirty-second of an inch—as will secure immunity from moisture. Use annealed foil, and anchor well the filling at the cervical wall, and build down squarely to where the upper edge of the bar will have to rest. Now comes the particular part of the operation—the filling of the space between the buccal wall of the cavity and the bar in position. For it must be remembered that it cannot be done well, and properly finished up, after the crown is anchored in place. Put the crown in place and fill the space between the bar and the palatine wall of the cavity with quick-setting oxyphosphate cement, and when it hardens, remove the crown. Slip in alongside the cement a matrix of wood or gold plate of the thickness of the bar, and continue to build down the filling in the cavity thus formed to the point to which the lower edge of the bar will come. Now carefully trim off, finish up and burnish with files, polishing tape, etc., so much of the filling as is inserted. Pursue the same course and proceed to the same point with the cavity in the canine, and remove the cement fillings. And now for the last time the crown is to be replaced, when it will be found that the bar will slip easily into place, maintained accurately in position by resting against the partially inserted fillings. The remainder is plain sailing. There will be no trouble

in holding the crown in place with one hand and solidly filling the two simple cavities (easy of access from the palatine aspect) left between the bar and the palatine wall of the cavity, and thus the crown is immovably anchored in the two solid fillings surrounding the bar. The dressing off of the gold upon the palatine aspect is all that is left to be done, and is a simple matter, the access being easy.

And now you will hear your patient, say, "Doctor, that is so nice—feels so firm and natural. No one can detect it. I would four times rather have it than a plate."

As to the cost of such an operation; some people like to know the "cost" of things. The price should be somewhat "fancy," at least remunerative; for it is a *nice* operation, requiring the judgment, taste and skill not possessed by a second-class operator. A fair price, I think, would be the usual charge for two gold fillings and a single tooth upon a rubber plate.

A little reflection will enable one to modify these manipulations so as to meet the peculiar requirements of particular cases.

In conclusion, I would add that I think there are great possibilities involved in this principle, and I believe that the more it is practiced the greater it will extend the range of dentistry, particularly in the direction of increased masticatory powers—*Southern Dental Journal.*

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## ARTICLE V.

### *Dental Education.*

BY J. B. HODGKIN, D. D. S.

The writer has no disposition to make this JOURNAL the organ of the College in which he is, unworthily perhaps, a teacher, but he feels that in view of the coming fall session of the various dental schools, he would fail to be just to his readers did he not clearly and distinctly set

before them the principles of dental education by which he has striven to be guided, and the plan of teaching a careful study of the wants of the profession he represents as a journalist and teacher has led him to adopt. It cannot, he thinks, be too plainly understood by those seeking it, just what a teacher proposes to furnish in the way of a dental education, and if any are disappointed in the future, we trust it will not be from lack of clearness of exposition of the needs of dental students, as he understands them.

Wherever the writer goes, and whenever he sits down to talk with an "*elder*", in the profession, trying to gain information as to the needs of the dental profession, in answer to the question "what do dental students need," the reply is *practical training.* "Teach my son, my student, the things he would do every day." "Train him so that beyond a question he can master his work." "Drill him in the practice of dentistry." And the "*elder*" will go on to say that the study of bile pigments, white blood corpuscles, theories of Shiff, Beale, Heitzman and others, while in the highest degree interesting as theories, yet in the light of *practice* are worth little in the ordinary routine of office work. "What is best to fill teeth with," "How can I so stop this cavity as to add to the comfort of my patient longest;" "In what way can I cure this diseased root and make comfortable what is now intolerable"—these are the things that most nearly concern the patient, and, consequently most nearly concern the dentist.

And the "*elder*" will go on to tell of the rubbish of the past and beg that it be swept away. What matters it to the practitioner whether aconite gets its name from growing on rocks, or that its other name is hellebore, or whether it has three or five or two leaves. We get the tincture from the druggist all the same, and its uses and dangers are all which concern us. He will tell you how through long and weary sittings, made the more painful by alternating between vials of medicines, and making notes whilst handling these, and listening, he gained the knowledge that the

diseases of children were treated differently and exhibited different symptoms from those of grown up folks.

We must say with all the emphasis we can put into words, that the complex course on physiology of that part of dentistry which involves the manufacture of artificial teeth and much else which still holds its place in the curriculum of dental teaching, is a burden too great to be borne, and that it is well nigh useless is seen in the fact that when dental students become dental graduates they rapidly lose this stock of information. They are *informed* that these things are so—they do not know them for themselves. But of the things which really concern them, and of which they cannot have too much, of this they hold on to, and add to and eclipse the teacher, because it is the legitimate study of their chosen profession.

We are no pessimist, but we cannot but feel now, even as we saw when a college student, that much of that which is taught as knowledge is but clever speculation, that ingenious hypothesis takes the place of fact, and that the love of appearing learned behind men's eyes to the requirements of the times. Dental students want learn dentistry, and it is a small matter to them whether knee joint injuries are, special dangerous, or how many successful amputations of the head of the femur have been performed. Knowledge is good· No one loves it more than the writer. He would love to spend his life in its pursuit. But realizes that life is brief, sadly brief, that much of so-called knowledge taught dental students, aye, and medical students as well, concerns them as little as the question of the moons of Mars, and is of as little value. If medical students are to be savers of lives and easers of pain it will not be out of the multitude of text books and "notes of lectures," not by trotting at the heels of the ward surgeon, or staring at a speculum the clinical professor has inserted into a diseased organ, but by seeing for themselves at short range and trying for themselves the things they need to learn. And equally so of dentistry, and it is this which must make the

crown of glory of dentistry—*actual practice.* What, then, is the special want of the dental student? It is *practical knowledge;* and the writer feels sometimes, in witnessing the vague seeking after hazy truths, if truths they are, seen in schools of all sorts, that a good old-fashioned course of study in a laboratory and by the chair of a careful operator would be a better *post-graduate course* than following with a medical course the study of dentistry.

Nothing has cost the writer more labor, and some pain too, then the elimination from his course of teaching the error in the guise of truth which inevitably gathers in the teachers' mind and port-folio. But he has conscientously striven to teach nothing but the tried and tested, and not to waste the time of the student with either dead theories or valueless issues. If dentists and dental teachers would in a common-sense fashion work out these problems we feel sure it would be for the good of the profession. We would not abolish the chair of Anatomy and Physiology, (though we would banish forever Materia Medica) but we would trim these down to close facts and deductions, and we would make *dental practice* loom up so as to be more than all the rest.

The writer should add that he alone is responsible for the views thus expressed. He trusts they may be none the less carefully weighed because they are individual. There are men, honest and sincere, and seeking the good of dentistry, who are strongly advocating the blending dental schools with medical. We feel that such men have not weighed the situation justly. Dentists are already taught too much *outside of dentistry;* and a dentist need no more be a doctor of medicine to successfully pursue his chosen profession than the M. D. would need excavators and pluggers to cure infantile diseases.

## ARTICLE. VI.

### *The Disorders of Primary Dentition.*

There is no fact more generally recognized in infantile medicine than the influence exercised by dentition on the general health of children. "A fine child, until it commenced to cut its teeth," is not alone a familiar saying; the experience of the greatest physicians have proven its truthfulness. In all the best works on infantile pathology, both ancient and modern, the influence of dentition is regarded as indisputable. But it must be admitted that this doctrine has been, perhaps, carried too far; the best clinical observers have been obliged to protest against the assertions of many who would attribute most of the diseases from which children suffer to the influence of dentition. This protest is evident in the works of Rilliet and Barthex, in the clinical lectures of Trousseau, the treatise by Bouchut, and in Dr. West's remarkably practical book. None of these practitioners desire to exaggerate the role of dentition in the etiology of infantile diseases; but its influence in this respect is not contested or denied. It is, in fact, an opinion current in medicine since the days of Hippocrates, and confirmed by Sydenham, Haller, Hunter, and the contemporary authors we have already cited. However, certain voices have been lifted against this generally received opinion. After showing that dentition had been accused of producing many disorders not referable to it, which is perfectly true, certain authors have denied that teething has any influence in the production of morbid phenomena.

M. Magitot, whose authority on any subject connected with the teeth cannot be denied, has particularly combated the commonly received opinion. In his work on the disorders attending the irruption of the teeth, published in the *Archives de Medecine*, in 1881, he seeks to prove that dention has no part in the production of the disorders imputed to it, and that these disorders are merely coincidences.

He recalls the opinions of Rosen, Andral and Trousseau, that great caution should be used regarding the disorders of dentition, an opinion carried much further in the works of the distinguished English dentist, Dr. Tomes. We will consider, later on, the arguments brought forward by M. Magitot to sustain his opinions. To commence with, it seems to me useful to consider the question under three principal heads:

1st. Should we admit, in certain cases, the existence of a difficult, laborious dentition, and if so, what are the characteristic signs?

2d. Can this difficult dentition induce disorders proper to this condition, and characterized by their nature, course and duration?

3d. When a child is teething should all the maladies which may present themselves be laid to the influence of this physiological act?

These different questions do not appear to me of difficult solution. Dentition is a physiological act, but not necessarily accomplished, on that account, without pathological reaction.

Children who pass through the period of primary dentition without presenting any symptoms of suffering constitute veritable exceptions.

The incisors and the first molars often pierce the gums without provoking any very marked reaction, but the irruption of the second molars, and particularly of the canine teeth, generally causes much more trouble. The phenomena which accompany the eruption of the teeth have, with reason, been divided into local and general. The most common local phenomenon is salivation, and this is the more remarkable as the buccal mucous membrane in young infants is generally dry, as Dr. West has rightly observed. At the moment when the gums become swollen and the crown of the tooth becomes prominent through the thinned surface of the gum, then the infant constantly drivels and wets several handkerchiefs in a few hours, which does not

happen with a child before the fifth month. This exaggerated secretion of saliva can only be explained by the excitation transmitted to the salivary glands along the mucous membrane of their ducts.

If the irritation is more marked, and the child very impressionable, the hands are carried incessantly to the mouth, and the infant bites at and rubs against the gums any hard object within reach, particularly objects which communicate a sensation of cold. At a more advanced stage of irritation aphthæ are developed and thrush may supervene. The gravest manifestations of the irritation produced by dentition constitute what has been called odontitis infantum, characterized by a veritable stomatitis with ulcerations, which may persist so long, and determine so much suffering as to give rise to great anxiety for the life of the child, although West has never observed any case where these disorders actually caused death. In the presence of such symptoms it is difficult to deny the possibility of local disorders induced by dentition. We admit that these grave symptoms are rarely observed, but Trousseau, Guersant, West, Rilliet and Barthez mention them, and their occurrence cannot be placed in doubt. It is not, however, on this point that the principal objections have been formulated; but against the disorders affecting the general system and imputed to dentition. It is, in effect, impossible to deny, with any appearance of reason, the existence and etiology of the local disorders, with which every physician is acquainted; but when we are in presence of disorders, such as diarrhœa, skin eruptions, convulsions, fever, etc., which present nothing special, then it is less difficult to deny the influence of dentition, and pretend that the occurrence of these sypmtoms at this period is a mere coincidence; that these may be observed at any period of infancy, and that they are attributed, without any sufficient proof, to the effect on the general system of the process of teething. Nevertheless, no physician who comes frequently in contact with sick children hesitates in recognizing these evidences

of constitutional disturbance as due, or referable to dentition, not in all cases, but in certain conditions of daily observation.

Reflex sympathetic phenomena are manifested in infancy with peculiar energy, of which we have daily proof; agitation, fever, vomiting and convulsions, are often induced by slight, but constant sources of irritation, such as a badly placed pin or a boil irritated by the contact of dry and hardened dressings. How, then, can it be denied that a continuous pain in a swollen gum, which persists and cannot be relieved, may throw the infant into a condition often exceedingly distressing?

Since the application of a blister or sinapism often determines convulsions in a nervous child, why should the continuous irritation of dentition be incapable of prouducing the same symptoms.

It is true our opponents seek to establish that this pretended pain of dentition is purely mythical; that there is no reason why the eruption of the tooth should cause pain, since there is neither effraction nor traumatism, but a very gradual wearing away or absorption of the tissues of the gum. It would then be necessary to prove and demonstrate that the different tissues pushed outward and compressed during the evolution of the tooth do not suffer in any way from this compression, which it would appear exceedingly difficult to admit.

When a vigorous child of from six to eight months, nursed by a healthy mother with excellent milk, is suddenly observed to lose sleep and gayety, become irritable and quit the breast after a few attempts to nurse, while at the same time it drivels incessantly; when, again, after a careful examination of all the functions, no explanation can be found for this change, except that the gum is hot and painful when touched, it must necessarily be admitted that the process of dentition has caused these disorders. A few days pass, the general malaise persists, or is augmented in intensity; diarrhœa may come on without any change in

the habitual diet of the child. No active treatment is instituted, and yet, all of a sudden, the morbid symptoms disappear, and examination of the gum shows that the irruption of the tooth is complete. Can the conclusion, then, be other than that we have already formulated ?

This is not a case invented for the occasion, but a fact of daily observation ; with some children even the irruption of each tooth or group of teeth is attended by these morbid symptoms.

[TO BE CONTINUED.]

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## ARTICLE VII.

### "*The Follies of Fashion.*"

Just now the medical profession of England are carrying on an energetic crusade against the health destroying follies of fashion. The movement is quite universal, and seems to give promise of good accomplishments. Recently M. Fredarick Treves (*Lancet*) delivered a lecture on this subject, which promises good results, since it was a plain, intelligible, matter-of-fact exposition of the results of the deadly style of dress in vogue among fashionable women ; and was listened to by many of so-called leaders of fashion. The speaker, among other good points, said: "There is, however, no tyranny so oppressive as that of the mode. A women might as well be dead as out of the fashion. There is something mysterious in this submission, because it is perfectly well known that the rulers of fashion are not its leaders. If the facts were fully and plainly stated, the fashionable intelligence would not announce that at a particular assembly Lady Little Waist wore gorgeous apparel, of such and such material and made in such and such a style, but that Messieurs or Mesdames Snip and Stitch *exhibited a costume* on the person of Lady L. W." This statement will hold equally good in our own country. It is a dismal fact that women who desire to be fashionable

seem to imagine that, to accomplish their purpose, they must resort to the most outrageous vagaries of dress, such as are calculated to seriously injure their physical welfare. The terrible habit of spending an evening in an overheated ball-room with low neck and short sleeve dresses, and then going out into the cold night air with but little extra covering, cannot be too strongly condemned. It is a wonder that in every instance such imprudence is not rapidly followed by pneumonia. A medical journal is the proper place for the discussion of such points, since physicians possess great power and influence to mitigate the evil. The family physician, in nearly all cases, is a trusted friend and confidential adviser, in addition to his professional role. His wisdom is considered great, and his words carry much weight. If, then, physicians will earnestly combat the evils of dress, and lose no opportunity to battle against them, much good can be accomplished. For foundation stones in this warfare, let them take the fellowing points: Flannel to be always worn next the skin; clothing to be loose and suspended from the shoulders, so as not to constrict any portion of the body; shoes large and roomy; warm covering to the feet, and very little to the head. With these fundamental principles, intelligent common sense will supply the superstructure of advice in every case. Let us sincerely trust that physicians will recognize and utilize the undoubted powers they possess to reform the dress of our women, and to banish from the world much of the sickness and deformity due to our present abominable system or style of fashionable attire. To do so is a duty that physicians owe to their fellow creatures, and he who neglects to utter this little word of warning is morally speaking, criminally negligent.—*Medical and Surgical Reporter.*

## ARTICLE VIII.

### *Farinaceous Infant Foods.*

Under the above title Dr. Geo. B. Fowler publishes in *The American Journal of Obstetrics and Diseases of Women and Children*, Vol. xv., No. 2, April, 1882, an inquiry into the chemical composition of the principal prepared foods for infants now found in the market. Dr. Fowler states that he was impelled to undertake the critical examination of some of these preparations on account of the importance of discovering as perfect a substitute as possible for mother's milk, because of the frequency with which we are compelled to employ these foods, and on account of the conflicting experience of the profession regarding their relative utility. He specially emphasizes the fact "that simple microscopic inspection, unaided by chemical means and physical processes, is wholly unreliable and inadequate in determining the composition and nutritive worth of these farinaceous compounds." Dr. Fowler begins the discussion of his subject by alluding to the relative nutritive value of the various grains employed in the preparation of the foods in question, with a view to forming an approximate estimate of relative proportions in which each should be employed. This basis for a scientific discussion of the subject is founded upon the important physiological fact that, to fully subserve the purposes of natural nutrition, foods must contain albuminoids, hydrocarbons, and mineral matters in proper proportion. Since the proportion in human milk, the natural food for infants, between the albuminoid and non-albuminoid ingredients is as 1 to 2.95, it is just to assume that the same relations should obtain in the artificially prepared aliment. These data would seem to justify our belief that the most desirable substitute for human milk may eventually be synthetically ompounded. No elementary food product, however asily digested when employed alone, is sufficient for the

maintenance of health or even of-life. By proper processes it is, however, possible to vary the relative proportions of constituents in flour produced from any grain by the admixture of flour from other cereals. In this way a food sufficient for prolonged normal nutrition may be prepared. Dr. Fowler next formulates the leading facts relating to the structure of different cereal seeds, and states the chief microscopical features of gluten, starch, dextrine, and other ingredients of foods obtained from this source. The author then gives the results obtained by chemical microscopical examinations of the various foods of the shops. Their names are mostly familiar. The chief ones are Horlick's Food; Imperial Granum; Ridge's Food; Nestle's Milk Food; Anglo-Swiss Milk Food. Dr. Fowler shows that the actual composition of many of these preparations does not at all correspond with the published statements concerning them. He does not, however, attempt to decide which of the foods is best adapted to the wants of infants, but leaves this question to be settled by practical experiments based upon chemical and microscopical examinations such as he has conducted.—*Med. Record.*

## ARTICLE IX.

### *The American Medical Association.*

The thirty-third annual session of this representative Association met at St. Paul, Minnesota, on June 6th, at 11 A. M. In the absence of Dr. Woodward, the President, who is now in Europe on account of his health, Dr. Hooper, Vice President, delivered the usual address. The Governor of Minnesota also made an address, welcoming the delegates to his State.

Protests were read from a number of Societies, against admitting the delegates from the New York State Medical Society. Letters were also read from Prof. S. D. Gross,

Dr. Woodward and Dr. Lewis Sayre, the latter to the New York State Medical Society, refusing to act as their delegate, on account of his not agreeing with their action regarding the Code of Ethics.

On the examination of the register there were found to be over 950 members present.

On June 7th, after the reading of several invitations and announcing the nominations, Dr. Dennison, of Colorado, offered a resolution, with the view of correcting a misconduct which exists in the public mind, and to some extent among members of the medical profession, as to the liberty of action authorized by the Association in the treatment of disease.

The committee appointed at the last meeting to consider the advisability of journalizing the Transactions, reported favoraly, and action was taken looking forward to establishing a journal.

J. A. Octerlony, M. D., then read an address in Medicine, after which the Judicial Council made their report, in which they unanimously decided that the New York State Medical Society having fallen below the standard required by the Association, in adopting certain resolutions antagonistic to the Code of Ethics of the Association, were not entitled to representation. This was the only report that could be expected in the case, and though the men who it affected have, through the organ, attempted to disparage the Association in its usefulness, it will undoubtedly give a severe check to those medical men who wish to trade in their profession. Before adjourning Dr. Marcy, of Boston, delivered an address on Obstetrics.

June 8th was, for the best part, consumed by routine business, appointment of committees, etc. During the latter part of the day, Dr. Byrd, of Illinois, read an address on Surgery, and Dr. Gihon, of the United States Navy, delivered the address on State Medicine.

June 9th, session opened at 10 o'clock by the reports of the different officers. Dr. Keller offered a resolution in

favor of cremation; referred to the Committee on State Medicine. Dr Dennison's resolution, offered on June 7th, reported above, was laid on the table. The resolution offered by Dr. Gihon, United States Navy, regarding expert testimony, was agreed to.

Cleveland was chosen as the next meeting place, and the following gentlemen were elected officers for the ensuing year: President, J. L. Atlee, of Lancaster; Vice Presidents, E. Grissom, N. C.; H. A. Saul, Ark.; J. A. Octerlony, Ky.; H. S. Orle, Cal.; Treasurer, R. J. Dunglison, Philadelphia; Librarian, C. H. A. Kleinschmidt; Secretary, W. B. Atkinson, Philadelphia; Committee on Publication, Drs. Atkinson, Cohen, Lee, Woodbury, Dunglison and Trike, all of Philadelphia.

After addresses by Dr. Goodwillie, of New York, on Dental and Oral Surgery, and on Diseases of Children, by Dr. S. E. Bury, of Washington, miscellaneous business was transacted, and the Association adjourned. From the importance of the subjects discussed, the meeting can be said to have been most successful.—*Med. Register.*

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### *Pennsylvania State Dental Society.*

The Fourteenth Annual Session of this society will be held July 25th, 26th, and 27th, at Williamsport, Pa. Arrangements have been made with the rail roads by which tickets can be secured at reduced rates, by presenting orders obtained from the Corresponding Secretary. The Park Hotel has reduced its figures from three to two dollars per day, to guest attending Convention.

Williamsport is delightfully situated on the North branch of the Susquehanna river, 70 miles North-west of Harrisburg, and is 900 feet above the sea; surrounded by some of Pennsylvania's finest mountain scenery, making it exceedingly picturesque, and with health giving atmosphere makes it an exceedingly pleasant resort.

The following programme has been prepared by the executive committee:

*Essays.*— President's Address, C. B. Ansart, D. D. S., Oil City. "Lesions of the Alveolus," N. E. Magill, Erie. "The Influence of Constitutional Defects upon Dental Tissues," by C. S. Beck, M. D., D. D.S., Wilksbare. "Nervous Force and Nervous Lesions" illustrated by vivisections, by N. C. Barrett, M. D., D. D. S., Buffalo. "What Constitutes Success in Dental Practice," by D. T. Nay. D. D. S., Bedford. "Reaction of Dentine with Special Relation to the Combination of Gold and Amalgam in Approximate Cavities," by H. C. Register, M. D. Philadelphia "Adjusting Artificial Crowns to Roots of Natural Teeth," by W. H. Fundenberg, D. D. S., Pittsburg.

*Demonstrations.*—"Pivoting all Porcelain Crowns," by N. G. A. Bonwill, M. D., Philadelphia. "Pivoting Weston's Crowns." "The Application of Gold and Amalgam in Combination," by H. C. Register, M. D., Philadelphia.

Baltimoreans can secure excursion tickets by presenting orders at the following Stations, Union, Calvert, and Corner Baltimore and Calvert Sts.

W. H. Fundenberg,
Pittsburg, Pa. *Corresponding Sec'y*

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## *National Dental Association of the United States of America.*

The next meeting of the National Dental Association of the United States of America will be held in Washington, D. C., in the lecture hall of the National Museum of the Smithsonian Institution on the 3rd, 4th and 5th of August, 1882.

The meetings of the Association in Washington are quadrennial and international. A cordial invitation is extended to all members of the Profession in this and other countries to be present at this meeting.

R. Finley Hunt. D. D. S., *Sec'y.*

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## *American Dental Association.*

The Twenty-second Annual Session of the American Dental Association will be held at Cincinnati, commencing Tuesday August 1st, 1882.

Geo. H. Cushing, *Rec. Sec.*

### *Southern Dental Association.*

The Fourteenth Annual Meeting of the Southern Dental Association will be held in the building of the Baltimore College of Dental Surgery, Corner of Eutaw and Franklin Streets, Baltimore, Md., commencing Tuesday, August 8th prox. A cordial welcome is extended to all dentists to attend.

E. S. CHISHOLM, *Pres.*
W. H. HOFFMAN, *Sec'y.*

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### *New York State Dental Society.*

The Fourteenth Annual Meeting of the above society, was held at Albany, N. Y., May 10th and 11th, 1882.

The following officers were elected for the ensuing year:

President, L. S. Straw, Newberg; Vice-president, Frank French, Rochester; Treasurer, A. H. Brockaway, Brooklyn; Secretary, J. Edw. Line, Rochester; Correspondent, W. A. Atkinson, New York.

J. EDW. LINE, *Secretary.*

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# EDITORIAL, ETC.

*The Connection of Dental with Medical Education.*—When the Editor of this JOURNAL entered the dental profession in the year 1855, the highest aim of the most reputable dental practitioners, and especially of those directly connected with dental teaching, was the recognition of dental science as a department or specialty of medicine. The organization of Dental in connection with Medical Departments by such old and honored Universities of Medicine as Pennsylvania, Harvard and Mary-

land, now established facts, would at that day, as it has at the present, have elicited the warmest commendations, and been received as an evidence of the appreciation of the dental art, not only by the medical profession, but by the intelligent portion of the public. This desire for recognition, had not, during the many years it remained ungratified, become extinct, and every respectable practitioner of dentistry who has the honor of his profession at heart, must welcome such an appreciation of the dental art, and be fully convinced of its importance in elevating the status of dentistry to an equality with the profession of the occulist and aurist.

Although the subject of dental education had engaged the attention of some of the most talented members of the medical profession for many years, yet until within a few years past, they were unwilling to accord to it a rank equal to that of other recognized specialties in their older and honored science. The principal reason for such opposition in the past, was the comparatively small number of educated dental practitioners; the majority of those who professed to practice dentistry being persons without any professional education or knowledge beyond mere handicraft, and who had forsaken various mechanical pursuits to engage in the practice of an art which they considered to be more remunerative and less laborious. And while the desire for recognition on the part of the mother science has been cherished up to the present time, it has only been within the last two decades that dental science has become worthy of being ranked as a department of medicine. Within the time referred to a greater number of educated gentlemen have adopted dentistry as a profession, and by their scientific investigations and valuable inventions, have accomplished the truly wonderful and important improvements which have had such an influence in placing it in the position it now occupies, and rendering it worthy of the recognition now accorded it.

It was the dearest wish of the principal founder of the oldest of our dental colleges, as expressed to the writer on more than one occasion, to have the institution, in whose welfare he was so deeply interested, united with the Medical Department of the University of Maryland. And we feel perfectly safe in stating, that if the majority of the dental practitioners now

connected with separate dental schools, could secure similar positions in Dental Departments connected with Medical Universities, such dental schools would cease to exist, and dental teaching be conducted where superior advantages are presented to the dental student. The intelligent public will soon begin to discriminate between the young men who are educated in a manner equal to the demands of their science, and those who are taught the mere handicraft of their art, and whose ability consists in manipulative skill, without the knowledge required to properly direct such skill. The result will be a higher grade of dental graduates, who can justly claim an *esprit de corps* which will serve as a stimulus to both study and practice. That the days are numbered of such dental schools as are in the habit of advising their students that the Infirmary and Laboratory will furnish all the knowledge required for the practice of dentistry and that Chairs of Clinical Dentistry are unnecessary, is beyond doubt. When practical instruction wholly devolves upon demonstrators, such a course must surely result in a limited experience, and prove detrimental to the student who is compelled to confine himself to a particular mode of practice. which may not in all cases be a reliable one, or to the use of a particular material to the exclusion of others equally useful.

The science of dentistry in its present status requires more than mere manipulative skill; its practitioners must be properly educated in its theory also, for it must be remembered that the reputation of every profession depends upon the intelligence of its practitioners.

We should educate our dental students in such a manner as will enable them to meet the family physician in consultation, when the nature of a case requires it, and intelligently furnish the dental details on which the efficacy of his constitutional treatment may depend. The dental students should also, in many cases, be able to prescribe such constitutional treatment if called upon to do so; and such occasions are by no means rare in a dental practice. And even if the patient, before resorting to the prescription of the dentist, should consult his physician, the intelligent opinion of the former cannot fail to prove beneficial by an increase of respect for, and greater confidence in his professional ability on the part of the patient.

Everyone judging impartially, must admit that the advantages offered to dental students by Dental Departments in Medical Universities of well established reputation, will enable such students when they become practitioners of dentistry to better meet the requirements of their profession, and enjoy to a higher degree the confidence of the community in which they locate. Taking the Dental Department of the University of Maryland for an example, let us briefly refer to the connection existing between its medical and dental departments. In the first place, the Dental Department of the University of Maryland forms an integral part of that old and honored institution which was organized in the year 1806, by Nathaniel Potter, M, D., John B. Davidge M. D., Jas. Cocke, M. D., Thomas E. Bond, M. D., Wm. Donaldson, M. D., and others, and which has always maintained an enviable reputation throughout the entire country. Its Dental Department is not a mere appendage nor is the connection so established a pretended one made merely as an offset to other institutions which have followed a like course.

On the contrary, the dental student in the University of Maryland, has all the advantages of the medical student in addition to the dental instruction he receives from the dental practitioners who compose a portion of its faculty, and who have been connected with dental teaching in another institution for very many years. The superior advantages to the dental student of an extensive University of Medicine cannot be overestimated, whether such student desires to confine himself to the study of dental science alone, or intends to become a graduate of medicine also. The opportunities for aquiring knowledge from the Surgical Clinics in a Hospital which receives 24,000 patients annually, and the experience to be gained from the Oral Surgery Clinics by an accomplished Surgeon whose reputation is so well established, should certainly prove incentives and enable the dental student to meet all the demands upon his professional skill which after practice may present.

It is beyond question the fact that the proper place for the study of dentistry is the Dental Department of a reputable Medical University when the connection is so intimate and veritable as that which exists between the Medical and Dental Departments of the University of Maryland. It should also be

remembered that the dental diplomas of the University of Maryland Dental Department will bear a date *thirty-four years elder* than those of any other *dental school.*

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*Maryland University Dental Department Building.*—By the time the present Number of the JOURNAL is issued the extensive Dental Infirmary and Laboratory Building of the Dental Department of the University of Maryland will be completed and fully equipped with complete dental appliances. This is the only structure, so far as we know, that has ever been built solely for dental use, and hence its arrangements have been most carefully attended to with a view of having it meet all the requirements of a building devoted to infirmary and laboratory uses. Although the Infirmary Hall, which occupies all of the second story is not so large as that of the University of Pennsylvania, Dental Department, it excells all others in size, and by its position affords unobstructed light by means of twenty-five large windows, a convenience which no other Dental Infirmary, not even the one just referred to can claim. The first floor contains the extensive Laboratory (the largest we believe in existence,) the Extracting Room and the Impression Room.

The Laboratory will accomodate, as at present arranged, one hundred students with separate desks and work benches for mechanical work of every description, besides containing all of the most recent and improved apparatus, rendering it superior to any private laboratory whatever.

Marble top wash stands, water closet, closet for students instruments, and a cloak room complete the arrangements of this large and superior dental structure, which will afford every facility for practical instruction in both operative and mechanical dentistry.

The Operating Hall is supplied with Morrison and Archer chairs, one before each window, the majority being of the former style, with a large number of dental engines, brackets for instruments, electric mallet and battery and gas apparatus, etc., etc. The Infirmary and Laboratory are both capable of accomodating several hundred students.

*The Amalgam Question.*—I am somewhat perplexed about the amalgam question, or rather the injurious effects of mercury as used in dentistry. Some weeks ago there was published in the newspapers an account of Senator Hill's troubles, the probable cause of which was attributed to amalgam fillings in his teeth.

I have been asked a good many times since if amalgam fillings were injurious, and have given a negative reply. To my sursurprise in looking over the proceedings of the American Medical Association (in the *Virginia Medical Monthly*, of June '82, page 188, section on Dentistry,) it gives amalgam fillings the name of being and doing some very bad things. If the six conclusions as presented by Dr. Talbot be true, I am very much in the dark, and would like to have more light on this subject.

I have not seen the deleterious effects spoken of, nor do I want to see them. If I am poisoning people by putting amalgam in their teeth I want to stop it at once. I have my doubts about the mercury in amalgam fillings producing poison, also red rubber plates. The worst mouth that I have ever seen was produced by a badly fitting *gold* plate. If you can give me any information on this subject I will be much obliged.

ENQUIRER.

That this qustion of amalgam is taken up with apathy by the writer, is unquestionable. It is getting hackneyed. If Dr. Talbot saw all he professes to have seen, then no one can blame him for sounding this loud alarm. But did he? It was the German poet Gœthe we think who said that "the eye sees what it caries with it the capacity to see," and too often it is the case that the eye sees only what it *desires* to see. The truth is probably that the writer of the paper read before the "section of Dentistry" saw a chance to make a sensation before a body of men whose fears were naturally easily excited on such a subject, and taking his stand, *per saltem*, he proceeded to gather around him the "facts," seeing them with a desire to see them just so.

It is doubtful if Dr. Talbot would have the courage to read such a paper before any reputable dental association, and if so, and he be *at* all sensitive, he would speedily wish *to* be elsewhere.

The wish to find out the *wherefore* is most laudable, but we feel perfectly sure that many of the cases of so-called mercurial or arsencial poisoning, are discovered so to be simply because the searchers had made up their minds beforehand that these *were* cases of so-and-so. What has become of the torturing neuralgias caused by contact of gold with amalgam? The writer honestly thought he had seen some such cases,—thought so because he was taught that this trouble must inevitably occur under such circumstances. Now almost daily he sees gold fillings "patched" with amalgam, and proximal fillings of the latter put in against gold grinding surface fillings, and no trouble results. The preceptor of the writer was so uncompromising a foe to amalgam as to cut out any such filling, declaring it unfit for use, and that on the ground that it would not preserve teeth! He was among the most conscientious dentists we ever knew. But his eye only carried with it the power to see the amalgam failures. At the last, and a little before his death he said sadly, "I shall have to come to it," meaning amalgam, but he died first. Oh! the talk that is in this world, founded on a few illy observed and improperly applied facts! Our correspondent may take comfort. Only this day the writers' eye fell on a newspaper paragraph that Senator Hill's malady was brought on by smoking, and a few days ago he saw it stated that it was caused by a ragged edge of a tooth abrading the tongue. And yet what have these savants to say of the multitudes of cases of idiopathic cancer, of cancer of internal organs, cancer of the liver, stomach, rectum, testicle, brain concur where it is impossible for etxernal cause to be the producing factor? Meantime our correspondent can go on and make as many amalgam fillings as he cannot do well with gold, and keep a clear conscience as to mercurial poisoning, which, so far as fillings is concerned is mercurial nonsense. If he could step suddenly into Dr. Talbots' office we have little doubt that he would surprise him in *flagrante delicte*, the very act of poisoning his patient, apologising for it by saying that "*he* was very careful, only using the purest materials," etc.

J. B. Hodgkin.

*The Two Editors.*—The undersigned has of late, for just reasons, taken the trouble to sign his name to editorial articles written by him. Opinions and sentiments the reverse of those entertained by him are entertained and expressed by Dr. Gorgas. This he has a perfect right to do; but it is unfair to credit the associate editor with them, or, on the other hand, to ascribe to Dr. Gorgas the ideas the writer may print. It will be understood therefore—this seems *not* to be universally understood—that *unsigned* editorial articles are not those of

J. B. HODGKIN.

# MONTHLY SUMMARY.

*The Medicinal Value of Vegetables.*—A celebrated cook-book discusses the medicinal value of vegetables, as follows:

"Asparagus is a strong diuretic, and forms part of the cure for rheumatic patients at such health resorts as Aix-les-Bains. Sorrel is cooling, and forms the staple of that *soupe aux herbes* which a French lady will order for herself after a long and tiring journey. Carrots, as containing a quantity of sugar, are avoided by some people, while others complain of them as indigestible. With regard to the latter accusation, it may be remarked, in passing, that it is the yellow core of the carrot that it is difficult of digestion—the outer, a red layer, is tender enough. In Savoy, the peasants have recourse to an infusion of carrots as a specific for jaundice.

"The large, sweet onion is very rich in those alkaline elements which counteract the poison of rheumatic gout. If slowly stewed in weak broth, and eaten with a little Nepaul pepper, it will be found to be an admirable article of diet for patients of studious and sedentary habits. The stalks of cauliflower

have the same sort of value, only too often the stalk of a cauliflower is so ill-boiled and unpalatable that few persons would thank you for proposing to them to make part of their meal consist of so uninviting an article. Turnips, in the same way, are often thought to be indigestible, and better suited for cows and sheep than for delicate people; but here the fault lies with the cook quite as much as with the root. The cook boils the turnip badly, and then pours some butter over it, and the eater of such a dish is sure to be the worse for it. Try a better way. What shall be said about our lettuce? The plant has a slight narcotic action, of which a French old woman, like a French doctor, well knows the value, and when properly cooked it is really very easy of digestion."—*Med. Record.*

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*Is This a New Dental Disease?*—A child, aged ten, whose teeth six months ago appeared to be all perfectly sound, came to me with tooth ache in the right lower canine. I found that a large portion of the enamel had disappeared from the front surface of the tooth, as if it had been chipped violently off; the dentine was exposed, but there was no softening or appearance of decay. The disease, which was commenced in several of the other incisor teeth, appears first as a small white spot in about the thickest part of the front surface of the enamel, which it seems to penetrate; find then, suddenly disintegrating, this comes away, and exposes the remaining sensitive enamel and the dentine. This disease is altogether a different thing from the gradual decay or wear at the neck of the teeth, frequently met with in adults, for in this case the patient is only ten; and, as far as I have been able to ascertain, the incisors and canines never have been known to decay in the manner above described. We are often at our wits' end to cope with that increasing prevalence of caries in the teeth of the very young; and if this be (as I fear it is) a new form of destructive energy, the sooner it is recognised the better.—*British Medical Journal.*

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*Removal of Foreign Bodies from the Ear.*—In the Detroit *Lancet*, Dr. A. F. Kinne, after pointing out the defects in all the existing instruments and methods for the removal of foreign

bodies from the ear, describes a simple instrument, devised by himself, for this purpose, which has answered admirably. It really consists of a minute, sharp-pointed, tenaculum-shaped hook, for the removal of foreign bodies from the nose. In order to remove a foreign body that has been pushed through the tympanum into the deeper recesses of the ear, it may, in some cases, become necessary to detach the auricle before an instrument can be brought to bear upon it. As a justification for this operation, he relates the following case:—

About twenty five years ago, I was called to a well grown boy whose ear had been torn off, close to his head, by a wagon wheel. The wound was ragged and dirty, and the bystanders thought the ear "no good;" but the skin in front of it was not tore through, and I decided to attempt its restoration, and succeeded. I pinned it on with cambric needles, annealed and curved And, when I passed my ligature around the ends of these, I sought to bring the torn edges into close apposition, without drawing it tightly enough to interrupt the local circulation.

Of course, very complete access to the middle ear is gained by detachment of the auricle. And, as to the feasibility of the operation, two questions, and the only ones of any consequence, were settled well enough by the results of this incident. First, an ear will grow on again, even if the incisions by which it is detached are not smooth and clean; and second, the resultant scar is one of no consequence, especially when it is located behind the ear.—*Med. and Surg. Reporter.*

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*Congenital Teeth.*—Dr. F. B. Harrington reports the following case in the Boston *Medical and Surgical Journal:*—

Two small white spots were accidently noticed on the lower jaw of a child, then twelve days old. The spots were supposed to be thrush. Four days later the mother complained that the child caused her great pain in the nipples while nursing. An examination of the mother s breasts did not show adequate cause. On looking into the child's mouth the two spots were found to be two sharp-edged incisor teeth. They were removed and appeared to be the right central and right lateral lower incisors.

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## ARTICLE I.

### *'he Fourteenth Annual Meeting of the Southern Dental Association.*

The annual meeting of the Southern Dental Association 'as held in the Baltimore College of Dental Surgery, com-iencing Tuesday morning, August 8th, 1882, at 10 o'clock. . great many of the prominent dental practitioners of the outh with quite a representation from the North and 'est, were present, and the meeting proved to be one of ie most interesting ever held by this Association. The .ssociation was called to order by the president, Dr. E. S. hisholm, of Alabama. An address of welcome was made y Dr. B. Holly Smith, Jr., of Baltimore, and responded ) by Dr. J. R. Walker, of New Orleans.

#### ANNUAL ADDRESS.

Dr. Chisholm delivered the annual address. He said the rganization has a mission to perform, or its prime incentive .ils, and the result is a useless expenditure of time and ieans. Its object is to elevate dentistry, improve the ands and hearts of those who practice it, and tender the oon of greater usefulness to humanity. This body, syste-iatically provided with resources for investigation, seeks ie development of hidden truth. A dental society should

not be a piece of machinery glued together by virtue of its age, number of its members, the name and character it gives, nor the honors it confers. Neither should it be the salve of conventionality nor the servant of autocracy. A dental society should be the recognized vehicle of a progressive age, and fully awake to the spirit of modern advancement. It does not matter how perfect a dental organization we may have unless it may be applied to its legitimate use; unless it fulfils the mission intended it becomes a weight and discouragement, and ultimate abandonment of effort is inevitable. The establishment of a better social feeling among the brotherhood is of no minor import in the work before them. What more befitting spot on God's green earth, he asked, could dentists come to than the Monumental City—Baltimore—the Athens of dental lore, whence germinated our honored profession? This, too, the realized, identical old Baltimore College of Dental Surgery, whence disseminated that spontaneous germ that has within the short period of a few years grown to the magnitude of a dignified and liberal profession. The time-honored college, the founders of which were the first to launch forth upon a sea of uncertainty in search of a new profession, now stands a glorious monument of a demonstrated fact, establishing the verity of and the necessity of its existence. We can claim to have attained that elevation that makes us public benefactors. A growing interest in behalf of the Association is being awakened throughout the southern, central and even some of the northern States. Its membership is increasing by the induction of much of the bone and sinew of our ranks. The peculiar feature of this session will be the extensive and elaborate clinic instruction, conducted under the ablest clinical corps ever present at any of its meetings.

The following members answered to their names at roll call immediately after organizing, very many coming in afterwards and during the subsequent sessions:

Dr. E. S. Chisholm, Tuscaloosa, Ala., President: Dr. W. H. Hoffman, Charlotte, N. C., Recording secretary; Drs.

L. D. Carpenter, Atlanta; R. B. Winder, Baltimore; R. Finly Hunt, Washington; J. R. Walker, New Orleans; F. J. S. Gorgas, J. H. Harris, and Geo. W. Massamore, of Baltimore; H. J. McKellops, St. Louis; J. B. Hodgkin, Washington; V. E. Turner, North Carolina; J. C. Uhler, Baltimore; J. B. Patrick, South Carolina; Geo. B. Steel, Virginia; M. W. Foster, Baltimore; T. M. Allen, Alabama; J. P. Holmes and J. H. Coyle, Georgia; W. A. Mills, Baltimore; W. R. Bull, South Carolina; H. A. Lowrance, treasurer, and W. W. Ford, of Georgia; J. A. Hurdle, of North Carolina; Geo. F. Keesee and J. F. Thompson, of Virginia; W. H. Atkinson, of New York.

The following names were presented by the Executive Committee and elected as members of the Association:

Drs. L. T. Caughey, Maryland; B. Holly Smith, R. B. Winder, Jr., Wm. B. Finney, Benjamin Flannigain, Baltimore; C. L. Alexander, N. C.; John Miller, New York; William Townes Hicksford, Virgania; A. F. King, New York; A. D Barrett, Norfolk, Va.; D. E. Everett, Raleigh, N. C.; W. W. Freeman, Maryland, B. M. R. Hopkinson, Baltimore, ; E. R. Rust, and D. Rust, Alexandria, Va.; J. M. Riggs, Hartford, Conn.; E. D. Hamner, Galveston, Texas; G. B. White, Chester, S. C.; Corydon Palmer and Delos Palmer, New York; Henry S. Abendschein, Baltimore; F. W. Slueds, Hampton, Va.; T. H. Parramore, Baltimore; R. A. Holliday, Georgia.

Dr. E. Parmly Brown was received as a delegate from the Dental Society of the State of New York. Visiting members who were extended a cordial welcome: Dr. Chas. R. Butler, Cleveland, Ohio; Dr. E. Parmly Brown, Flushing, N. Y.; W. G. A. Bonwill, Philadelphia; Dr. Haskell, Chicago; Dr. H. H. Dwinelle, of New York.

Drs. Carpenter, Walker and Hunt, were appointed a committee on membership.

On motion of Dr. Allen, the medical profession of Baltimore were invited to attend the meetings. The committee appointed to revise the constitution of the Association, Dr.

F. J. S. Gorgas, chairman, submitted a report, which was considered by sections, and elicited much discussion, occupying the time of the Association to the hour of adjournment.

Adjourned until Wednesday morning at 9 o'clock. No night session being held.

WEDNESDAY AUGUST 9TH—SECOND DAY.

The Association reassembled at 9 A. M., Dr. E. S. Chisholm, President, Dr. W. H. Hoffman, Secretary.

This day was devoted to clinics in operative and mechanical dentistry and to the delivery of clinical lectures. Those who lectured were among the most prominent practitioners of dentistry in the country, some of them men who have written valuable works on the subject. The object in delivering the lectures was to better demonstrate what has been written, as it was stated a much clearer idea could be given in that way than in written essays. The clinics were given for the purpose of demonstrating the mode of operating by men of much practical experience, and much valuable information was imparted. Dr. L. P. Haskell, of Chicago, during a clinic in mechanical dentistry, made a full continuous gum set of teeth, and his skillful workmanship was closely watched by other experts. Clinical lectures were given by Dr. J. M. Riggs, of Hartford, Conn., on "Riggs Disease;" by Dr. W. G. A. Bonwill, of Philadelphia, on "Bonwill's Crowns," &c.; by Dr. H. J. McKellups, of St. Louis, and Dr. W. H. Dwinelle, of New York, on "Irregularities." The two latter attended the Medical Congress in London a year ago, and in their lectures gave the result of their investigations while attending that body. Clinics in Operative Dentistry were given by Dr. Corydon Palmer, of New York; Dr. C. R. Butler, of Cleveland, Ohio, and Dr. E. Parmly Brown, of Flushing, New York. Prof. James H. Harris exhibited some gold fillings in the mouth of Dr. James H. Tucker, of Va. which were inserted nearly seven years previously, and which were pronounced by all who saw them to be some of the very best operations ever performed.

EVENING SESSION.

A business meeting was held and the consideration of the constitution was again taken up. It was decided to divide the territory of the Association into four districts, as follows: No. 1—Maryland, Delaware, District of Columbia, Virginia, West Virginia and North Carolina. No. 2—South Carolina, Georgia, Alabama, Mississippi and Florida. No. 3—Louisiana, Texas, Arkansas, New Mexico, Arizona and Indian Territory. No. 4—Kentucky, Tennessee and Missouri. The president, second vice-president and executive committee is to be selected from the district in which the next meeting is to be held; the remaining four vice-presidents to be selected from the three remaining districts in order, and one—the first—from the country at large. The constitution was finally adopted as a whole.

Dr. Wm. H. Dwinell, of New York city, was elected an active member of the Association.

Dr. Hunt, from the committee on the revision of the roll of membership, submitted a report which was adopted. A large number, the report said, had not responded to a circular sent out as to whether they intended to remain as members of the association.

Dr. J. F. Coyle, of Georgia, made an address in behalf of the *Southern Dental Journal.* Dr. Coyle spoke of the importance of printing the thoughts adduced at assemblages of this kind, so as to be understood throughout the profession.

Dr. F. J. S. Gorgas, Dean of the Dental Faculty of the University of Maryland, made an instructive address on the subject of Dental Education. Dr. Gorgas said that an educated brain and hand contributes to the wealth of a country can be as applicably applied to dentistry as any other of the professions. Education is a labor-saving process. There was a certain amount of incompetency among dental practitioners, as in all other professions, which escapes through our colleges. That those who were engaged in dental teaching could not conceal from themselves that it would be desirable to raise the average level of dental acquirement, skill and capacity, and the question is what measures will best promote a better professional education. And while we should inculcate a high standard of knowledge, and bid God speed to progress in an age of science

like the present, there is danger that the dental student will be drawn from what is practical, useful, and even essential by well meant enthusiasm. We should endeavor to direct or limit progress by considerations of its relative utility. We must guard against all that mistakes novelty for value, or flatters by a suggestion of exclusiveness in its pursuit. Nearly all dental colleges as well as medical have a board of trustees, but their affairs are administered by the professors, on whose efforts their success wholly depends. Neither a University nor a Board of Trustees or Regents can safely ignore the advice of the teachers and assume more than a general supervision. The object of all dental schools should be to supply practitioners thoroughly competent in all common dental matters, able first to identify and then to treat therapeutically and mechanically the local diseases and lesions of the dental structures, and be free from the prejudices and errors bequeathed by an earlier age of our art. If Dental Colleges could be governed on the principle that it is better to turn out a few graduates educated to a certain standard than a large number not educated quite so well, then a radical change in the present plan of dental teaching would be demanded. But at the same time great care would have to be exercised lest such a system should prove exclusive or impracticable to the many. Good judgment is more to be desired in a dental student than great learning. Any professor will say that it is better to instruct *de novo* than to eradicate opinions inculcated by incompetent preceptors. A general knowledge of anatomy is imparatively demanded in the dental student, and a knowledge of physiology is also necessary. Modern chemistry is the basis of materia medica. A knowledge of general surgery is of great advantage to dental surgeons. Dr. Gorgas said that the establishment of dental departments in universities of medicine was an important movement—a department not of lectures on dentistry only, but where the student has the advantage of clinical instruction and operative dentistry and oral surgery.

The mere establishment of one or more dental chairs in a University for the purpose of securing the delivery of lectures on dental subjects, and which is not supplemented by the necessary clinical instruction, would fall far short of the require-

ment, mechanical talent being one of the first requisites to success in the practice of dentistry. But the case is materially different where a Dental Department as perfect as possible in all its appointments, having its separate dental faculty, its Infirmary and Laboratory and Lecture Hall, independent in its government, is established in connection with a reputable Medical University, wherein the dental student has all the advantages of the medical student in addition to those of his own particular specialty. Dental students may then gain a broader medical education, the benefit of which in the practice of dentistry is beyond denial.

Dr. J. H. Coyle, of Georgia, read a very interesting paper on the same subject of Dental Education. He referred to the fact that dentistry could not be taught by others than by dentists. [Applause.] He was not opposed to dental departments in medical colleges where they were *bona fide*, and thought in the future they would largely control dental education.

Dr. J. B. Hodgkin, of the Baltimcre College of Dental Surgery, on the same subject, argued that it was not necessary for a man to know all about the intricacies of the medical profession or to know all about the human system to become a good dentist. There was, he said, too many departments now about a medical college, and he did not believe in putting another suckling there without a nipple.

Adjourned until Thursday morning.

THURSDAY MORNING AUGUST 10TH—SECOND DAY.

The Association met at 9 A. M. prior to which time clinics were held in celluloid by Dr. Evans, of Washington, D C., and in continuous gum work by Dr. L. P, Haskell, of Chicago. Dr. Charles L. Steel and Dr. L. M. Cowardin of Richmond, Va. were elected active members. Drs. H. J. McKellops, J. M. Riggs and J. H. Coyle were appointed a committee on dental appliances. Dr. R. Finly Hunt, of Washington, made an address explanatory of electro-plating, and Dr. W. H. Atkinson spoke of an improved base for artificial teeth. Dr. Atkinson said that to substitute any part of the human body was an art of the highest order.

Officers for the ensuing year were elected as follows: President, Dr. L. D. Carpenter, of Atlanta, Ga.; First Vice Presi-

dent, Dr. J. M. Riggs, of Harford, Conn.: Second Vice President, Dr. R. A. Holliday, Atlanta, Ga.; Third Vice President. Dr. J. R. Walker, New Orleans, La.; Fourth Vice President, Dr. H. J. McKellops, St. Louis; Fifth Vice President, Dr. J. F. Thompson, Fredericksburg, Va.; Corresponding Secretary, Dr. J. P. Holmes, Macon, Ga.; Recording Secretary, Dr. W. H. Hoffman, Charelotte, N. C.; treasurer Dr. H. A. Lowrance, Athens, Ga.; Executive Committee, Drs. J. H. Coyle, T. M. Allen, J. B. Patrick, R. A. Holliday and A. G. Bouton.

Dr. George F. Keesee, President of the Virginia State Dental Association, was received as a delegate from that Association. Atlanta, Ga., was selected as the next place of meeting. A paper on "Dental Education," prepared by Dr. W. P. Dunlap, of Alabama, was read by Dr. T. M. Allen. The paper stated that some thirty years ago there was but one dental college in existence—the Baltimore Dental College. Reference was made to the rapid increase of dental colleges, and in some instances diplomas were granted when not a chair in the college issuing them is filled nor a student within their walls.

Dr, Wm. A. Mills, of Baitimore, referring to the paper read on Dental Education, said that he differed with Dr. Hodgkin, who claimed that all that was necessary to make a successful dentist was an experienced eye and a skilled hand. If he believed that, he would resign his connection with dental associations, go home and put out a sign "Cheap teeth made by steam." &c. More was wanted than to be a mere machine. A medical education was one of the essential things necessary in order to be a competent dentist.

Dr. J B. Patrick, of Charleston, S. C., read a very interesting paper on "Fœtal Medication—the true Hygiene Prophylaxis of Dentition." Dentists should endeavor, he said, to impress upon women that the health and well-being of children depended much upon them. Children are fed with food they cannot assimilate nor digest. Dr. Patrick argued that the health and habits of the maternal parent had much to do with the proper condition of the teeth of their offspring.

Dr. Atkinson, of New York, followed in an interesting scientific discussion of the matter contained in the paper, and became so warmed up on the subject that he took his coat off

and spoke in his shirt sleeves. Dr. Atkinson spoke of the importance of giving the mother such food as she requires, and as much of it as she needs, and if she wants pickles, give her pickles, [laughter;] and if children want to chew on gravel or roots, let them do whatever their natures require. [Applause.]

Dr. E. Parmly Brown, of New York, read a paper on "Operative Dentistry." He said the colleges number about a score, the societies many scores, and the journals almost another score, and it depends upon the student himself whether he gets the knowledge demanded or not, and when he gets that knowledge to do his work thoroughly. [Applause.] Thoroughness not only meant a gold filling—a solid gold filling well anchored margined and contoured properly—but it meant all this and more too; to be thorough in all the branches of the profession, and to charge sufficiently to obtain thoroughness. [Applause.] A vote of thanks was tendered Dr. Brown.

Dr. W. W. Ford, of Macon, Ga., spoke of the difficulty of obtaining sufficient pay in his part of the vineyard. Time should be taken to do the work thoroughly, and the pay should be sufficient. The Doctor cited as an instance a lady who complained of his charge for filling a tooth, and said that she would rather lose the tooth than pay so much. He at once offered to give his time and work for nothing and to extract the tooth without pay. The lady preferred paying the bill to losing her tooth. [Laughter.]

Dr. D. McFarlan, of Washington, favored charging well, and then doing the work thoroughly.

Prof. Hodgkin and Dr. Riggs spoke of the use of anæsthetics in the practice of dentistry.

A paper prepared by Dr. H. M. Grant, of Abingdon, Va., was read by Dr. Hunt.

A committee on constitution and by-laws was appointed, consisting of Dr. Winder, of Maryland, Dr. Coyle, of Georgia and Dr. Turner, of North Carolina, to make further revision if deemed necessary and to report next year.

Adjourned to meet in Atlanta, Georgia, on the second Tuesday in August, 1883. The members of the Association were given a complimentary excursion on Friday, by the dentists of Maryland and the District of Columbia to Annapolis and Tolchester, on the steamer Matilda.

During the session, an invitation was extended to the members of the Association to visit the new Dental Infirmary and Laboratory Building and Lecture Halls, Museum, etc., of the University of Maryland, which was availed of by the majority of those in attendance, and who expressed their satisfaction with the complete arrangements provided for the instruction of dental students, The following standing committees were appointed by the President, Dr. L. D. Carpenter, to report at the next meeting to be held in Atlanta in 1883:

*Publication.*—Drs. W. H. Hoffman, of N. C., Chairman; C. C. Patrick, S. C.; R. A. Holliday, Ga.

*Dental Education.*—Drs. J. P. H. Brown, Ga., Chairman; C. L. Steel, Va.; A. C. Ford. Fla.; W. H. Marshall, Ga.

*Dental Hygiene.*—Drs. R. F. Hunt, D. C., Chairman; E. S. Chisholm, Ala.; G. B. White, S C.; R. A. Freeman, Ga.; S. G. Holland, Ga.

*Pathology and Therapeutics.*—Dr. J. M. Riggs, Conn., Chairman,; J. B. Patrick, S. C.; G. F. S. Wright, S. C.; G, J. Frederick, La.; E, L. Hunter, N. C.

*Histology and Microscopy,*—Drs. W. H. Atkinson, N, Y.; Chairman; W. W. H. Thackston, Va.; H J. McKellops, Mo.

*Chemistry.*—Drs. J. R. Walker, of La., Chairman; W. H. Dwinelle, New York; H. J. Royal, Ga.; D. Hopps, Ga.

*Operative Dentistry.*—Drs. J. H. Harris, Md., Chairman; T. Chupein, Pa.; A. G. Bouton, Ga.; W, S. Brown, S. C.; L. B. Barfield, Ga.; T. M. Allen, Ala.

*Mechanical Dlntistry.*—Drs. J. B. Hodgkin, D. C Chairman; W. W. Evans, D. C.; H. H. Keith, Mo.; L. M. Cowardin, Va,; M. S. Dobson, Ga.; J, C. Uhler, Md.

*Dental Literature.*—Drs. F. J S. Gorgas, Md., Chairman; A. O Rawls, Ky.; A. F. McLain, Cal.; W. C Wardlaw, Ga.

*Voluntary Essays.*—Drs. N. W. Kingsley, N, Y., Chairman; E, D. Hamner, Tex.; D. E. Everitt, N. C.; T. C. Moore, S. C.; J. S. Milbourne, Miss.; J. T. Calvert, S. C.; S. H. Henkle, Va.; J. G. McAuley, Ala.

*Dental Appliances.*—Drs. W. G. A. Bonwill, Pa., Chairman; W. W. Ford, Ga.; M. W. Foster, Md.; M. A. Bland, N. C.; S. A. White, Ga.

## ARTICLE II.

### *Dental Society Meetings,*

BY W. C. BARRETT, M. D., D. D. S., BUFFALO, N. Y.

That dentistry has made such rapid progress within the past two or three decades, is owing in great part to the beneficent influences of dental societies. Where, but a generation ago, our best men locked up within their own breasts the secret results of long experience or exhausting experiments, that they might enjoy their exclusive benefit, they now communicate their knowledge to their professional brethern freely, and as freely, and as freely receive in return. There are few, and they not usually among the best informed, who, rightfully belonging to a preceding age, yet hasten off to the Patent Office to secure the legal right to peddle out information, and make sure that the world shall not be the better for their having lived in it. There are some who even purloin the ideas which others would give to the public, and thus filch from the profession at large; but these last are usually mere hangers-on upon dentistry, who are not practitioners, and both classes are happily diminishing in numbers.

This satisfactory condition has been in great measure brought about by the dental societies which have been organized wherever a sufficient number of practitioners to form such a body could be periodically called together.

The continued association of dentists in the meetings of these bodies, has created an emulation as to who shall be able to lay before his fellows the greatest improvements in manipulation, the furthest advance in study and research, and the most direct and feasible method of reaching a desired end, or of overcoming an impending obstacle. The consequence is that no field of practical science is more thoroughly cultivated than is ours. The histology and morphology of no part of the human anatomy is to-day

better understood than that of the teeth and their integuments. But the rapid advance of a part of the profession has left far in the rear those of less studious habits or more sluggish understanding, so that in our societies to-day there are two classes of members—those who have outgrown the stale and standard topics of twenty years ago, and who demand more abstruse papers and discussions, and those who vote the time thrown away that is not devoted to what they call the "practical." Some way must be devised to satisfy the demand of both these parties, or dental societies will no longer serve the useful purpose which they have answered in the past. If the more advanced class, finding that they can derive but little benefit from the consideration of the stock subjects, gradually withdraw themselves, the profession as a whole will deteriorate; while if the younger and less experienced find nothing suited to their comprehension, they will lose all interest in the local societies, and progress will be arrested. Every dentist of broad views and a genuine love for his vocation, seeks not entirely selfish and personal benefits. He desires the good of the whole, and to this end he will labor. It only remains that he shall work intelligently. Those who have had years of experience should not lose sight of the struggles of their early days, but must aid the younger men to surmount the obstacles which were the greatest impediments to their own early advance. In the elementary societies, it is something worse than bad taste for the early practitioners to air their knowledge by pedantry, and the use of words of "learned length and thundering sound." Such pragmatical displays will not advance the cause which they profess to have at heart. Who that is in the habit of attending society meetings, has not heard the expressions of disgust and dissatisfaction at such waste of the opportunities of those who have, perhaps, at large sacrifice of time and convenience, come up to these meetings in the hope of obtaining useful knowledge? The wise essayist or speaker will endeavor to adapt his remarks

to the average intelligence of his auditors, and he who fires far above their heads is contracting the usefulness of dental societies, and injuring the cause which he desires to serve. Let him reserve his abstruse theories and disquisitions until he finds himself among men who can appreciate and intelligently discuss such matters. There are few of us but can recall more than one instance when a meeting which promised usefulness was chilled and stricken to torpor by the interjection of some wild vagary of the imagination, or some absurdly recondite and subtile theory, nothing whatever akin to the professed aims of the society.

The older dentists can all remember many a problem, simple now to their experience, which sadly puzzled their unpractised understanding at the outset of their career. A rehersal in plain and direct language of the manner in which they overcame these difficulties, will not only be a pleasant retrospect to them, will not only fix their knowledge yet more firmly in their own minds, but will be of great interest and benefit to those who are now treading the very road over which they, long ago, painfully passed. Essays and addresses of this character, the material drawn, not from text books, but from the broader, richer, fresher fields of their own practical knowledge, may introduce subjects not commonly touched upon in mixed societies, and foster a love for study in those who are inclined to confine their researches and their practice to mere mechanical manipulation.

It was after some thought upon this subject, and to illustrate my point by personal application, that I accepted the position as essayist for the coming meeting of a local society, and formed the determination to step out of the beaten track, and to present something different from the convential society paper. The subject which I selected—Materia Medica—was one that in the estimation of the average country dentist is a dry one, but I thought that by treating it in an unusual manner it might perhaps be invested with interest. I commenced by reviewing a very

few of the basal principles, spoke of general and local remehies then took up two or three of the principal ones in each of the four classes of Stimulants, Sedatives, Antispasmodics, and Anæsthetics, and very briefly described them. I then attempted a practical application by conducting a quiz, introducing an imaginative patient, describing a fictitious train of symptoms, and asking what should be the course of treatment. All the complications were those which I had good cause to remember as having arisen at different times in my own practice, and I found they were by no means strangers to the members present, nor were many of them entirely clear as to the best course of procedure under the circumstances. From their suggestions I I learned much myself, and I am sure that they in turn were benefited by the free interchange of opinion. At the risk of seeming rather to assume the pedagogue, I propose here to give a part of the questions propounded, with the answers which were finally agreed upon as proper, in the hope that they suggest to others a way for making such meetings beneficial. I commenced thus:

A young lady presents herself to you for the first time and is suddenly seized with a difficulty in breathing; not so severe as to demand instant remedial measures, but sufficient so to interfere with a proposed operation. What should be the first step?

ANSWER. Inquire if she be subject to such attacks.

If you find that she is what does it indicate?

A. Some probable organic difficulty; disease of the heart, or possibly aneurism.

How will it affect your proposed operation?

A. It will be necessary to proceed with extreme caution.

What will you do if the difficulty increases?

A. Place the patient in a recumbent position, in fresh air. See that the clothing be loose. Let her breath nitrite of amyrl, or ammonia. Use friction and give stimulants.

Would you give chloroform in such a case?

A. No. It would be especially dangerous.

If you find the patient is not subject to such attacks, to what might you propably attribute it?

A. Nervousness; hysteria.

What remedies would you use?

A. Sedatives and neurotics; camphor. The same directions as to position and clothing as in the former case.

How will you determine if a patient be fit to take an anæsthetic; chloroform for instance?

A. Inquire concerning faintings and dyspnœa, or alcoholism. Listen over the precordial region and see if the rythm of the heart be regular and clear.

How if you wish to give ether?

A. Examine the lungs, and see that the breathing be uninterrupted and regular.

If in the first steps of giving an anæsthetic, chloroform, for instance, your patient gets into a state of great excitement, would you push the administration?

A. By no means; suspend operations entirely, or give more air until quiet be restored.

If after the patient becomes unconscious from chloroform the circulation is interfered with greatly, the lips become blue and collapse seems imminent, what would you do?

A. Place her in a recumbent position in a current of fresh air, pull the tongue forward with a pair of forceps or with a hoe excavator that you may be sure the glottis is open, and then administer some kind of a shock to the nervous system—preferably an electric shock—but if a battery be not at hand use cold water, or a sudden concussion to start the heart into action, for its stoppage is the main source of danger. Make the patient breathe the fumes of nitrite of amyl.

How if the anæsthetic be sulph. ether?

A. Place her in a recumbent position as before, see that the clothing be loose and the glottis open. Send an electric current along the course of the phrenic nerve. Get up artificial respiration. In either case see that the bodily heat is kept up.

What is the principal source of danger in chloroform narcosis?

A. Stoppage in the circulation.

In ether?

A. Stoppage of respiration. Remedial measures should be primarily directed to start into action the heart and lungs respectively.

How would you set about artificial respiration?

It was here ascertained that not one of those present had ever witnessed the process, or had an intelligent idea of the manipulations necessary. The action of the principal respiratory muscles was explained, and the movements necessary to stimulate their activity, when a volunteer patient presented himself, Marshall Hall's and Dr. Silvestre's methods were illustrated. The necessity for dispatch was explained, and to give the necessary elevation to the chest the operator's coat was off, rolled up and in place, the supposed patient was placed in position upon it, and was perforce breathing synchronously with the movements in less than five seconds. A great deal of interest was manifested in this demonstration, and all became thoroughly familiar with the necessary movements.

If in the administration there be great nervous depression, what remedies are indicated?

A. Stimulants; alcohol, brandy, whiskey.

How if the patient cannot be induced to swallow?

A. Rub alcohol into the circulation through the skin.

If there be no stimulant at hand what would you do?

A. Apply friction to the extremities.

If in the administration of any anæsthetic the lips become livid, what is the probable cause?

A. Asphyxia.

What is the remedy?

A. Remove the anæsthetic and assist respiration.

After the administration of an anæsthetic and the recovery of conscience, if there be considerable depression and a tendency to sleep, what would you do?

A. Keep the patient in motion and assist the circulation by the administration of stimulants, remembering that the agent is in the blood, and must be eliminated mainly through the lungs, as quickly as possible.

Many incidental questions were asked by the members present, and details were demanded which it is unnecessary to repeat here, as I have endeavored only to set down the most concise answers returnable, and have made no attempt to sketch the sometimes extended debate over a query. The best method for the administration of chloroform and ether was discussed, and the necessity for something better than a folded napkin to apply to the face was pointed out. The dentists were reminded that while an atmosphere charged with four or five per cent. of chloroform might be breathed with impunity, ten or twelve per cent. especially in the earlier stages of narcosis, might result fatally. Almost any gas or vapor may be inhaled without special danger if it be sufficiently diluted. If a specific effect be desired this is best secured by giving the agent in specific quantities, and to this end, unless the operator has great experience and uses extreme caution, some good inhaler, which insures thorough dilution of the vapor, is essential to successful administration.

It can be readily seen that there are many emergencies in dental practice which might form the subject of a properly conducted quiz, and which would prove of especial interest to the younger practitioners. There will, in such a meeting, be a constant tendency to desultory discussion, which the conductor must have sufficient firmness to check. Long-winded "incidents," and personal reminiscences of cases interesting only to the relater, trivial circumstances, and the detailing of wonderful results as the consequence of the use of empirical remedies on the part of members, if allowed, will destroy the interest in any discussion. If the question under consideration be kept steadily in view, and every member be appealed to for concise and terse answers to the questions propounded, it is not difficult to

make a meeting of this kind exceedingly profitable to every one.—*Independent Practitioner.*

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## ARTICLE III.

### *American Medical Association.*

SECTION ON ORAL AND DENTAL SURGERY.

Dr. D. H. Goodwillie, of Mew York, Chairman.

Dr. Truman G. Brophy, of Chicago, Secretary.

TUESDAY, JUNE 6TH—FIRST DAY.

The Chair appointed Drs. Allport, Brophy, and Williams, sub-committee, to which all papers read before the section should be referred.

Dr. William D. Kempton, of Cincinnatti, presented a paper on "Oral Hygiene," of which the following is a synopsis:

From the beginning the sole aim of practitioners was to discover a cure for disease and, although sometimes harmful, the medication received the credit. Now, one of the main objects of practitioners is to prevent disease. The profession is indebted to specialists for many, if not most, of these discoveries, as they are more apt to arrive at definite results than those whose attention is occupied with the whole field of medicine.

Oral hygiene was very important, and the evils arising from the neglect of it were far reaching. Good, healthy, even strong teeth were beautiful as well as serviceable, and indicated care. But when we find one whose teeth resemble the charred trunks of stately trees after the fiery scourge has visited the forest, and whose breath is suggestive of a cess-pool, we ask, whence comes this sad havoc?

Dr. Kempton then entered into a careful analysis of the teeth giving their elements and functions, and the acid theory of decay by Dr. George Watt, with the factor that modifies the action of acids, viz., vitality. Then followed

list of the evils resulting from diseased teeth, showing hat the whole system was more or less affected and deranged; many of the cases of headache, earache, affections f the eye, and stomach, being traceable oftentimes to adly decayed teeth.

The doctor closed his paper with directions for preventng decay in teeth, prefacing with the remark that those eeth in which decay had already set in should be either xtracted or filled. Physicians should feel it their duty to oint out to their patients the results of neglect of the eeth, and no medical school should consider its corriculum omplete unless some attention is paid to the teeth.

PHOSPHATES IN FOOD.

The paper was discussed at length by Drs. Williams, Talbot, Allport, Lawrence, Marshall, Goodwillie, Ellmer, Reed and, others, during which the subject of Phosphates n Food was introduced, The enamel of the teeth is comosed mainly of phosphate of lime, and Dr. Allport was ery earnest when he made the remark that our food hould be taken as nearly as possible in the condition in which God prepared it. He referred especially to wheat, sserting that the so-called patent process of making flour radicated much of the phosphate in the wheat, the result eing that not enough of this was left to keep the teeth trong and healthy. He did not advocate the use of phoshates alone, but he did protest against food which had not nough of them to keep the system and teeth in perfect rder.

Dr. Lawrence antagonized the stress placed upon this ubject, alleging that other elements were as necessary as hosphates.

The Section then adjourned to meet at 3 p. m. Wednesay.

WEDNESDAY, JUNE 7TH—SECOND DAY.

HEREDITY IN DENTAL DEVELOPMENT.

Dr. W. C. Barrett, of Buffalo, briefly sketched a case which had come under his observation, and which he illus-

trated by plaster casts, showing the persistence of heredity in dental development.

Dr. J. S. Marshall, of Syracuse, N. Y., then read a paper on "The Need of Dental and Oral Surgeons in the Army and Navy." The following is a synopsis:

This subject has often been brought to the attention of the profession, but never formally till August, 1861, at the American Dental Convention in New Haven, where it was referred to a committee of five, who, after consultation with Surgeon-General Hammond, reported favorably to the appointment of dental and oral surgeons in the army and navy. In 1868 Senator Hamlin introduced a bill before Congress providing for the appointment of such surgeons in the army and navy, but this measure died before it was born. The second attempt was made during the Forty-second Congress by Representative Townsend, who merely advocated the appointment of such surgeons to the military and naval academies, but nothing came of this but the appointment of a dental surgeon at the naval academy at Annapolis with the rank of assistant surgeon. Dr. Marshall then stated the necessity existing for such appointments.

The government provides for the care of a soldier in all cases, except where his teeth are concerned. Soldiers on the frontier and sailors on a long cruse, have no opportunity of receiving dental services, no matter how much they may need such attention, and the disease must run its course, being turned over to the bungling of the hospital steward or some less competent person. The treatment of fractures or gunshot wounds of the lower jaw, is the same as twenty-five or thirty years ago, being much behind the times. The interdental splint, invented by Dr. J. B. Bean, of Georgia, during the civil war, and improved by Dr. Norman W. Kingsley, of New York, is a very great improvement in the treatment of these cases, and is endorsed by the best surgeons the world over. The success with this splint has been remarkable.

The objection to the appointment of dental and oral surgeons in the army and navy, is that the amount of oral diseases is so small as not to require specially educated surgeons to treat them. Dr. Marshall then gave some statistics showing the relative number of men in the army and navy who, in the years 1878 and 1879, were reported as having needed dental services, also the opinions of the surgeons general of the army and navy, General Hancock and Admiral Porter, relative to the appointment of such surgeons. To petition Congress for action is useless, without the heads of medical departments see the need and make the recommendation. The paper closed with a recommendation that a committee be appointed by this Section to arrange a blank statistical report covering all the dental and oral diseases, and request the surgeons general of the army and navy to incorporate them in the regular medical and surgical reports.

A lively discussion followed on the subject of the paper, which resulted in the offering of a resolution by Dr. Allport that a committee of three be appointed by the Section, who, in connection with Dr. Maynard, of Washington City, and the surgeons general of the army and navy, should make what efforts they deemed advisable regarding the appointment of dental and oral surgeons in the army and navy, and to report to the association next year. This motion was adopted, and Drs. Allport, Marshall, and Williams were appointed such committee.

FOOD IN ITS RELATION TO THE DEVELOPMENT OF TISSUES.

Dr. Lawrence, of New York city, presented a resolution calling for the appointment of a committee to consider the subject of food, including mastication, insalivation, digestion, and assimilation, in its relation to the development of the different tissues and organs of the body.

Drs. Lawrence, Talbot, and Kempton were appointed as the committee.

The Section then adjourned to meet Thursday at 3 p. m.

THURSDAY, JUNE 8TH—THIRD DAY.

Dr. Goodwillie called attention of the Section to cases of Necrosis from Arsenic, and illustrated them with wax models.

Case I. Showed by two models, necrosis of lower jaw from each ramos forward. The case, before and after, with a new deposit of bone without any deformity. Photograph of the patient also shown.

Case II.—Two models showing a case of poison by arsenic and necrosis of right superior maxillary.

*a.* Showing case one week after removal of necrosed bone; without, in the least, disturbing the soft tissue; also showing the formation of new bone.

*b.* The new bone complete and the mouth perfect; and no external deformity.

Case III.—Upper maxillary showing abscesses formed at nearly all the teeth, the result of applying arsenic to destroy sensibility of the dentine before filling the teeth.

The above served to show the sad results of the improper use of this powerful agent in devitalizing dental pulps.

Dr. Eugene S. Talbot, of Chicago, then read a paper on "The Injurious Effects of Mercury as Used in Dentistry." The paper was confined to the use of amalgam fillings in natural teeth.

"There can no longer be any doubt that amalgam fillings in teeth will sooner or later produce mercurial poisoning. The dire effects of this metal are not always seen immediately after the fillings are inserted, years sometimes elapsing before the injurious effects are felt and noticed."

The history of two well-marked cases were given by Dr. Talbot, the persons affected having called upon him for treatment. The amalgam fillings were removed, and gutta-percha temporarily substituted, these in turn being replaced with gold, after which all symptoms of mercurial poisoning disappeared. A detailed account of a series of experiments made by him were then presented, the conclusions and results being as follows:

*First.* Mercurial vapor is given off from amalgam fillings at all ages and from all varieties, even from fillings sixteen years old, the vaporization being sufficient in quantity to respond to chemical tests.

*Second.* Minute doses of mercury, if taken internally three times a day, are capable of producing decided effects.

*Third.* Mercury when inhaled into the lungs is far more active than when taken into the stomach.

*Fourth.* If small doses taken into the stomach occasionally are capable of producing marked effects, and the vapor is much more active than the solid preparations of the metal, is it not a necessary consequence that amalgam fillings which are constantly giving off mercurial fumes to be inhaled into the lungs, not a few times daily, but always, without cessation, day or night, do, in many sensitive persons, produce deleterious effects?

*Fifth.* When tons of this material are consumed annually, is it not credible that many constitutions are affected?

*Sixth.* Physicians in treating dyspeptics, anæmics, and persons suffering from nervous debility, would do well to examine the mouths of patients and know if artificial teeth on red rubber or fillings of natural teeth have in their composition mercury or any of its compounds.

The subject, "How Dentists should be Educated," was presented by Dr. W. W. Allport, of Chicago in a paper of considerable length. The introduction was a review of dental surgery—it, with all other branches of medicine, having emanated from a common center, and the possibility was that in the future these diverse systems would more and more tend to consolidate.

Dr. Allport then said that the dental and oral surgeon must be educated both in mechanical dentistry and oral surgery, for no disease can be intelligently treated without a knowledge of the histology, anatomy, and the physiology of the organ or organs diseased, as well as the pathology prognosis and rationale of the treatment employed to

restore the parts to a healthy condition; and this is medical science. The successful oral surgeon must have a thorough medical education in all its branches, supplemented by special instruction in dental surgery. Over forty years ago Drs. Harris, Hayden, and others, sought to establish a department for teaching dental and oral surgery in the medical department in the University of Maryland; but their application was refused. Dr. Harris, however, succeeded in organizing what was known as the Baltimore College of Dental Surgery, and the graduates of this institution were given the degree of D. D. S.—doctor of dental surgery. In addition to this, several medical colleges have been induced to establish dental schools in connection with their medical departments, but as yet none of these institutions have required a full medical education of their dental graduates.

All dental and oral surgeons should receive a medical education and become legitimate specialists in its practice, and all medical graduates should be as fully educated in diseases of the teeth and the science of their treatment as they are in other diseases.

Dr. J. B. Lawrence, of New York, then read a paper on "Medico-Dental Science," after which the Section adjourned.—*Medical Record.*

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## ARTICLE. IV.

### *Is Tobacco an Antiseptic?*

BY FRANK FRENCH, D. D. S., ROCHESTER, N. Y.

[Read before the Seventh District Dental Society April, 1882]

"When all things were made, none was made better than tobacco, to be a lone man's companion, a bachelor's friend, a hungry man's food, a sad man's cordial, a wakeful man's sleep, and a chilly man's fire; while for stanching of wounds, purging of rheum, and settling of the stomach,

here's no herbe like it under the canopy of heaven." So pake old Salvation Yeo many long years ago, and thousnds to-day will say amen ! to it.

Tobacco, that "precious stinke," as his vindictive majsty King James, called it, first became known to Euroeans shortly after the discovery of America. All its resent popular uses were probably known to the natives f North and South America, ages before Columbus was orn. When the Spaniards landed in Paraguay, in 1503, he natives came forth to oppose them, "beating drums, rowing water, and chewing tobacco and spirting the uice from their mouths upon the invaders" which as a eans of defense and offense, must have been a painful urprise to the Spaniards, if the Indians had anything of e accuracy of aim said to be attained by some of our estern friends.

Tobacco was no sooner introduced, than it was seized pon by the medical faculty as a valuable addition to their harmacopia. In a volume published by Henry Butler he ys "it cureth any griefe, dolour, imposthume, or obstruc-on, proceeding of colde or winde, especially in the head r breast. The fume taken in a pipe is good against rumes, tarrhs, hoarseness, ache in the head, stomach, lungs, reast; also in want of meate, drinke, sleepe or reste." ut very soon its opponents began a war against it and the attle which began two centuries ago continue still. King ames imposed the first tax on tobacco: in Russia smoking as punished by amputation of the nose; in the Swiss anton of Berne the offense ranked next to adultery. Innocent XII in 1690 solemnly excommunicated all who hould take snuff or tobacco in church.

It is not my purpose to extol tobacco; and I love it too ell to decry it, so that what I have to say will be in its onnection with our specialty, and is by no means intended s a tirade against it. I have tried to destroy as much of as possible by burning it and I expect to keep trying as ong as I live.

Tobacco contains nicotine in certain proportions, which is of itself *after* distillation, alkaline. As it exists in tobacco it is combined in *excess* with acid—10,000 parts of fresh leaves containing only six parts of nicotine, but fifty-one parts of mallic acid, and nine parts of nitrid acid combined with other substances. In its concentrated form its action upon the animal system is one of the most virulent poisons known, one drop being sufficient to kill a dog, and destroying life in man in poisonous doses in from two to five minutes. Havana tobacco contains 2 per cent. of nicotine, Maryland 2.3 per cent,, and Virginia 6.9 per cent., but these are from fresh leaves, and tobacco undergoes considerable chemical change in the process of curing, it being asserted that there is a much greater proportion of nicotine in prepared tobacco, than in fresh leaves. A fermentation takes place which converts certain pre-existing principles into nicotine. Another change is produced by burning it, as high as 9 per cent. of nicotine having been obtained by this process. The odorous principle of tobacco is said to be due to nicotine. The smoke contains Sulphuretted Hydrogen and Hydrocianic Acid in small quantities.

In connection with many others, when asked by my patients in regard to the effects of tobacco upon the teeth, I have been accustomed to say it was not injurious, where ordinary cleanliness was observed ; that it was a well known fact that those who used tobacco suffered less with their teeth than those who did use it, that it was antiseptic in its nature. I still think it is antiseptic, but I think I have proven by experiments during the past few weeks, that it is not antacid. My attention was called to it about a year ago while operating for a physician. He asked me what effect tobacco had on the teeth and I replied that it was antiseptic. He called my attention to the first right inferior molar and bicuspids, each of which was decayed on the labial surface at the neck of the tooth. I told him it was caused by chemical action from acid formations. He asked why on these and on none of the other teeth, and told me

that he felt sure it was caused by tobacco, as that was where he always carried it, and that he should discontinue the use of it. He was about 40 years old, had splendid teeth, took excellent care of them, and none of the others showed the least symptom of decay. About six months ago a gentleman, sixty-three years old, came in to have his teeth cleaned. He had the full number of teeth, 32, all of them perfectly sound except first right inferior molar and bicuspids, which were decayed at the margin of the gums, the same as the other case mentioned. I called his attention to them and he at once said, "Oh, that is where I used to carry my tobacco. I used it for forty years but have quit now."

Another case of a young man who had only chewed tobacco a year, and the molar and bicuspids were affected the same as the other cases mentioned. All three of these persons chewed what is called the "best fine cut."

I then began trying experiments, and resolved to call the attention of the society to it, that others might investigate, and also to give the result of my experiments. My plan has been to place a portion of the article to be tested in a small vial with pure water, cork it, let it remain over night and then test it for acid. It might be said that this is hardly as fair a test as it would have been to place it in saliva, but it must be remembered that saliva contains a small percentage of acid, and that in testing it you are far more apt to get an acid reaction than an alkaline, or even neutral. So that using pure water for the infusion, you probably get *less* acid reaction than if saliva were used. I have tried a great many different brands of cigars and in nearly every case there has been an acid reaction, some very marked and others only a trace; the cheap cigars showing far more acid than the higher priced ones. None of the cheap cigars but that showed acid distinctly, (when I say cheap cigars I mean five centers) while in many of the higher priced ones there was only a trace, and a very few, none at all. The moral of this is, do not buy poor

cigars. Smoking tobacco I have not tested at all, as this does not come in contact with the teeth. Chewing tobacco gave by far the strongest acid reaction; being marked in every case, and the very best was as strong as the poorest. One sample of what was said to be the very best in the market, after being placed over night in a vial with water, on touching the cork in the morning, it flew out with a pop, and effervesced like a bottle of beer. It turned litmus paper a bright scarlet at once. There, gentlemen, are the results of my experiments. I may add that I have smoked for 30 years and the upper tooth where I always hold my cigar, lost its vitality five or six years ago, but the lower one is perfectly sound. A friend who is an inveterate smoker, has lost entirely by gradual crumbling, the upper tooth where he held his cigar, while the lower one is all right. I do not say that tobacco had anything to do with either of us in producing this result. What think ye? —*Odontographic Journal.*

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## ARTICLE V.

### *Early American Dentistry.*

BY J. B. HODGKIN, D. D. S.

From an article in a Philadelphia newspaper, giving a history of the earlier days of that city, we condense some interesting items concerning the early days of dentistry of this country, and especially of Philadelphia. The practice of dentistry was at that time being taken from the hands of the barbers who had blended it with their calling, as a legitimate part of it. Of dentists, however, who made its practice exclusive, there were very few. One of the first who visited Philadelphia was a Dr. Lemayeur. This was nearly one hundred years ago—1784—and curiously the newly revived replantation and transplantation was in his practice a fashionable thing. He announced in an adver-

isement that he had successfully transplanted one hundred nd twenty-three teeth in the preceding six months, and e offered two guineas for every tooth which might be ffered him by persons disposed to sell their front teeth, or ny of them. It would seem that the price of living teeth as not materially advanced, as a daily paper not long nce contained the advertisement of a dentist offering two ollars—not so much by twenty-five cents, as was paid a undred years ago.

The first resident dentist of Philadelphia who could laim something more than ordinary tooth-drawing skill, nd who had scientific knowledge and experience, was Dr. acques Gardette, whose Christian name was soon Anglicised to James. He was a native of Agen, Department de ot et Garonne, in France, where he was born on the 13th f August, 1756. He received an ordinary academical ducation in a provincial town. He was sent to Paris to udy anatomy and surgery about 1773, and remained there wo years as a student at the Royal Medical School. His uition was considered to be completed after a course of ghteen months in the Hospital at Tours. After that he assed a regular examination at Bayonne by the surgeons f the admiralty, and received a commission as surgeon in e French navy. In the discharge of his official duty the essel in which he served came to America in 1778, and ortly after his arrival Dr. Gardette resigned from the avy. He had previously received some instruction in entistry in Paris, as a necessary part of his naval preparation, from M. Le Roy de la Fandiniere, a dentist in high epute, and had studied the only works in dentistry then xtant by Fauchard and Bourdet. Dr. Gardette practiced Boston and in Newport, and in 1783 established himself New York. His success there not being very great he ent to Philadelphia in the following year, and was engaged as a practitioner in dentistry for forty-five years fterward.

Dr. Gardette in 1785 resided in Pear Street, below hird. In 1791 he was at No. 88 Chestnut Street. In

1793 his office was at No. 75 Walnut Street, between Dock and Third, on the north side. This was the most fashionable part of the city. He removed to the corner of Ninth and Chestnut Streets in 1818. He retired from practice in 1829 and went to France, in order to revisit the scenes of his early life. He died at Bordeaux, in August, 1831. Gardette commenced the practice of dentistry at a time when the profession was but a few steps beyond the business of the tooth-drawer and the bleeder. Instruments were few, poorly made, awkward to handle, and needing forms and combinations which improvements in dental science have since introduced. Operations and processes were crude, and necessity must have compelled Gardette to introduce modifications and methods which have since become common professional property. He was the first to substitute elastic gold bands, or braces, in the place of ligatures of silk or fine gold wire in securing artificial teeth when attached to the living ones. He invented the manner of mounting natural teeth secured by means of gold pins upon a gold mortised plate, which permitted the teeth to rest upon the gum instead of upon the gold plate. He was the first to apply the principle of "suction," or atmospheric pressure, for the support of artificial teeth — doing away with the use of spiral springs and other inconvenient contrivances which filled up the mouth. This was done by him as early as 1800. The discovery of this principle was accidental, and was induced by finding that artificial teeth intended to be supplied with springs, but placed in the mouth of a lady in order to render her accustomed to them before the work was considered to be finished, were perfectly satisfactory to her without the springs when Dr. Gardette came to fix them, as he thought, permanently. Gold foil for filling teeth, instead of lead or tin, which was formerly used, was prepared by Gardette for his own use before the goldbeaters paid any attention to that manufacture. In 1822 the Franklin Institute awarded the Scott medal to Dr. Gardette for the three principal

improvements in dentistry above mentioned; also an Institute medal and a twenty-dollar prize for a lever instrument with which to extract teeth and stumps of teeth.

Dr. Edward Hudson was in practice in Philadelphia in 1802. He did not seem at first to find it congenial or paying, as we find him soon after in the stationery business and afterwards as a brewer. He resumed dentistry however in 1812, dying in 1833. The name of Hudson is familiar to those who have old dental books.

In September, 1808, Mr. Sanders, surgeon dentist, from London, announced that "his invented artificial teeth are of a composition of mineral harder than iron. Any color which never will change can be given to these teeth, and they can be made to fit so that no one can distinguish them from natural teeth. Mr. Sanders invites all persons whom accident, disease or age has occasioned to want elegant and useful aids to beauty, utterance and mastication, to honor him with a call. Decaying teeth can be preserved by filling their holes with a kind of cement which will stop the corruption, and prevent the toothache and bad smell which such teeth often occasion." Sanders did not remain in the city very long. He was evidently not familiar with the "code," judging from his advertisement.

"L. Koecker, Surgeon Dentist, late from Europe," appeared in 1812. Since then the tables have turned and the European dentist advertises himself as "late from America." His "Principles of Dental Surgery," was declared by Harris to be "one of the best treatises that ever issued from the English press." Dr. Koecker returned to England about 1822, and afterward resided there. He published an essay on "Artificial Teeth, Obturators and Palates," in 1832, and an essay on "Diseases of the Jaw," in 1834.

The card of Josiah Drummond, in 1818, announces that he was "prepared by a regular course of experimental instruction, &c., to propose his services in all cases within the province of his profession, from the incipient forms of

disease in dentition to the toothless defects of age or accident. Ladies and gentlemen who have objections to the use of foreign human teeth can be supplied with natural teeth which are not human to answer all the valuable purposes of the grafted human teeth." These "natural teeth, not human," were the teeth or preparations of the bones of animals.

About the same time, 1818, M. Dubuisson, announced that he had received "a beautiful collection of human teeth, which he offers to set on pivots only for $3, and $5 on springs." The era of cheap dentistry it seems set in quite a long time back, and advertising was freely made use of as a means of introducing the dentist, as is seen by the card of Dr. A. S. Van Pelt, in 1818, who gave notice that, "having gone through a regular course of study in the civil branches of his profession, and having reduced his theoretical knowledge to practice, tenders his services to his friends and the public as a dentist, &c. . . . He has engaged an Italian gentleman whose excellence, in an elegant and novel manner of inserting artificial, natural and human teeth, entitles him to rank among the most celebrated of the profession."

Just what "the civil branches of the profession" were in those days is matter for inquiry; but it is more than some dentists now-a-days succeed in, in "reducing their theoretical knowledge to practice." The Italian gentleman is introduced quite as handsomely as could be done in our day.

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## ARTICLE VI.

### *Ether vs. Chloroform.*

**BY DR. PEDGIN TEALE, SURGEON TO THE GENERAL INFIRMARY AT LEEDS.**

It is confessedly difficult, perhaps even impossible, to settle, by statistics, the question of the relative danger of

these two anæsthetics; chiefly for the reason that, while we know pretty nearly how many deaths from each agent occur during the year, we have not the means of ascertaining the relative proportions of the cases in which each anæsthetic has been used.

Such being the case, it may be worth while to record the opinions of those who, having for a great number of years had experience of chloroform, have also for many years (in my own case, more than six years), almost abandoned it in favor of ether. I wish, therefore, to tender my conclusions for what they are worth, based as they are, upon what I have seen in the practice of my colleagues and myself at the Leeds Infirmary, and upon my experience of anæsthetics in my private practice. My conclusions are as follows:

1. Ether, properly administered, is a much safer anæsthetic than chloroform. So much safer do I believe it to be, that I counsel every surgeon whom I can influence in the matter to study the method of its administration, and, to let ether take the place of chloroform. The exceptions I make in favor of chloroform are: in infants, in patients subject to asthma or chronic bronchitis, and also, perhaps, in cases of abdominal obstruction, with difficult breathing in which an operation has to be performed.

2, When many operations have to be done in rapid succession, to use ether is a great economy of time. A good "etherist" can get most patients under its influence in from one and a half to two minutes, whereas, in my experience, chloroform must be given from six to fifteen minutes before an operation can be commenced. I am aware that chloroformists trained in Edinburgh usually administer chloroform more rapidly than those trained in English hospitals.

3. A patient under the influence of ether is far more passive, and, therefore, in a more convenient condition for operation, than one under chloroform. As soon as the effect of chloroform is passing off, the patient becomes as

a rule, and often very suddenly, very sensitive to pain; whereas, in the case of ether, especially if the patient has been kept for some time under its influence, the return of sensibility to pain is very slow. In fact, a patient may become so far conscious as to converse with the surgeon while stitches are being made in the wound, and at the same time be entirely unconscious of pain. This was not my experience of chloroform.

4. When ether is administered without food on the stomach, troublesome sickness is very rare.

5. In using ether, the safety and comfort of the patient, the rapidity of the anæsthesia, and the convenience of the surgeon in operating, depend very directly upon the method of administration employed, and the manner in which the administrator does his work.

6. There are good methods of administration of ether and bad methods, and there are good and bad "etherists." The varying opinions of the value ether which prevail in the profession probably depend very directly upon the varying methods and manners of administration.

7. It is a bad method to give "ether on a towel," as first taught us by Dr. Joy Jeffreys, to whom England is deeply indebted for his successful crusade in favor of ether. This involves a great waste of ether, ten to twenty ounces being required. The patient's lungs are chilled, and bronchial *rales*, struggling, and maniacal excitement not unfrequently result. I, along with my colleagues, commenced ether under this system as a duty, and by no means an agreeable one, and held on doubtfully when I suspected that some patients probably died from the effects of the chilling of the lungs.

8. It is a bad method te give ether with the American basket-work frame, which, though not much better than the towel, served a good purpose as a step to better things.

9. The good methods are those in which the patient breathes over ether into an india rubber bag, a method, I believe, introduced into practice by Dr. Ormsby, of Dublin,

nd carried to further perfection by Mr. Clover. In this nethod, the patient breathes the same air over and over gain for six or eight times, thereby, economizing the heat f the air passages, economizing ether, and enhancing the ffect of the ether by partial asphyxia. My experience of he use of Clover's smaller inhaler, under good manageent, is this: (*a*) A patient can generally be ready for peration in a minute and a half, sometimes in less than a inute; (*b*) There is rarely any struggling; (*c*) Noisy excitement hardly ever occurs—perhaps, in my practice once a hundred times; (*d*) *Rales* in the trachea are but selom heard; (*e*) Instead of six or eight ounces of ether eing used in a short operation, and sixteen to twenty in ne lasting an hour or an hour and a half, half an ounce or ss suffices for a short operation (such as "sphincter-stretchg" or "iridectomy"), and two to three ounces for an peration of an hour's duration, such as colotomy or ex sion of a joint.

10. The administration of ether by inferior methods is ill too common, and was until recently prevalent in some our larger hospitals.

11. Even with Ormsby's or Clover's inhalers, there is infinite variety of skill in different etherists.

12. In order to become a good etherist, the administrar must *study how* to give either, must watch the patient *tentively* while giving it, and during the earlier inhalaons must very carefully and *studiously adjust* the unæsetic to the sensations of the patient.

13. A careful, attentive, student, with tact, and not rd and unfeeling, can easily and in a short time be taught give ether properly.

Since the adoption of Clover's inhaler, I have had singur freedom from anxiety about my anæsthetics—far greater eedom than in the previous period, when I had to depend on chloroform.

Finally, I would say that this favorable opinion of ether based upon my experience of its use by a series of very

able administrators—some in the Leeds Infirmary, others while acting as my private clinical assistants. Speaking as a looker-on, rather than as an administrator, I should say that the chief points in the right administration of ether are: first, to overcome the nervous dread of the patient by applying the mouthpiece only; then to turn on the ether gently, until the glottis becomes tolerant and the patient is slightly unconscious; lastly, to complete the anæsthesia rapily. In advising beginners, I compare the regulation of the quantity of ether to the "curve of harmonic progression."—*British Med. Journal.*

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## ARTICLE VII.

### *The Disorders of Primary Dentition.*—(Continued.)

If these facts are not constantly observed, they are at least common, and it is certainly very rare to find a child who has not suffered more or less during the period of dentition. I have observed, for my part, a child who never had one of his first twenty teeth without suffering from one or several convulsions, and who has never presented any since the period of dentition.

What we have said of the fever, diarrhœa, and nervous disorders, can be repeated with equal justice for the multiform eruptions frequently observed in similar cases. There is nothing special to distinguish these eruptions, any more than the intestinal or nervous disorders, from those produced by other and widely different causes. They demonstrate, however, the existence of disorders in the functions of the various organs, and in the secretions, produced by dentition.

What especially characterizes these eruptions is the period of their appearance and the manner in which they follow "the evolution of the teeth, preceding and accompanying the irruption of a group of teeth and then disappearing."

If all the morbid symptoms observed during dentition
nnot be ascribed to this physiological act, it is not the
ss true that these disorders, appearing only at this period,
companying the irruption of the teeth and ceasing when
is is accomplished, do not leave in doubt their veritable
usation.

It may be admitted that dentition is not an isolated phe-
omenon; that it coincides with a period of peculiar ac-
vity in the development of the child, principally with the
rmation of the bones, the increase of the glandular sys-
n of the digestive apparatus, and at this moment the
rvous sensibility is at its highest pitch.

This is all true, but it is certain that dentition, particu-
rly when painful, has a preponderating role in the causa-
n of these morbid manifestations.

After denying that teething can be of itself painful, M.
agitot demonstrates that traumatisms practised on young
imals at the period of dentition, and affecting more or
s deeply the gum or the tooth, do not determine any-
ing comparable to the disorders attributed in children to
e evolution of the teeth.

We are of opinion that there can be no analogy between
e sections, punctures and tearing of the alveoli in these
periments, and the normal evolution of the tooth, which
parates, forces out and slowly compresses the tissues.
is last is a purely vital act, not in any manner repro-
ced in the traumatisms already mentioned, which induce
dely different reactions.

In the same way the numerous diseases of the teeth,
ries, ulcerations, etc., may often induce very severe pain
thout provoking any symptom resembling those observed
ring the period of the evolution of the teeth. The re-
ions are peculiar to this period and are analogous to
se observed during the evolution of other organs.

The opinions of M. Magitot are reproduced in the ably
d conscientious thesis presented by M. Leveque to the
ris Faculty.

We have particularly considered the seven observations given by M. Leveque, and we find that several might be given as types of the disorders induced by dentition, and the interpretation of them given by the author is, to say the least, extremely far-fetched. But these objections do not mar the value of the work; it is possible that the author will persist in his ideas if he practices dentistry exclusively. But it would be entirely different if he is called upon to follow, in their maladies and indispositions, young infants, to have them under his care during their development, and be obliged to interpret their sufferings. He would then remark, with all clinical observers, that dentition exercises a very marked influence in the production of infantile disorders, and he would soon recognize how solidly the opinion he combats to-day is established.—*M. Blanchez, in Med. and Surg. Reporter.*

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## ARTICLE VIII.

### *The Decadence of the American Family.*

We do not like to be doleful, but it is impossible to ignore some of the facts that have been presented within the last year or two by Dr. Goodell, Dr. Nathan Allen, and others. These facts relate to an alleged change in the physical organization of our men and women, and to the decadence of family life among Americans. Dr. Allen, who has been studying this subject for many years, presents the case very directly in an article entitled "The New England Family" (*The New Englander*). It is asserted that the objects of the institution of the family are three: the propogation of children, the preservation of chastity, mutual help and company. In each of these respects the American family, especially the New England family, shows a marked and progressive deterioration, since one hundred years ago.

As regards the propagation of children, it is shown that the average native New England family is very much less

productive than formerly. This, we are told, is due not alone to the induction of abortions and the prevention of conception, as was at one time asserted, but to a change in the physical organization of the parents. Individuals in whom the balance of tissues and functions is not well preserved are less fertile. The very nervous, or the very lymphatic temperaments accompany a lessened reproductive power. The tendency of the age is to a one-sided, intellectual cultivation and undue and artificial development of nervous tissue; hence a comparative sterility. The birth-rate in New England families has been steadily declining until now it is lower than that of any European country except France. One additional element in this, no doubt, is the habit of delaying marriages—a habit made almost necessary by the more expensive style of living which is demanded, and by what some consider the selfishness of young men who prefer not to sacrifice their liberty to the responsibility and expense of domestic life.

Another indication of family deterioration is the increase of divorces. These were rare a hundred years ago, now they number one to about twelve marriages in New England, while among our foreign populations, who are less educated, and even less moral, the ratio is one to forty or fifty.

Many evidences are brought forward to show that marriage does not accomplish all that it has done or ought to do in preventing adultery. The frequency of the charge of adultery in divorce suits is great, it being made in about one-third of the cases. The increase in late marriages, which leave many more of both sexes exposed to temptation, is an undoubted factor in the alleged increase of licentiousness.

As regards the third object of marriage, "mutual help and company," our author alleges the decrease in the number of marriages, the modes of life and business by which men are kept away from their homes, turning their whole energies in every direction except the making home

pleasant. To the New York, as well as New England business man, home is often only a place to eat and catch his breath in during the intervals of business. It is also alleged that New England women are losing their love of offspring and home.

The family life of the American, therefore, according to the above indicment, occurs more rarely, begins later in life, is blessed with fewer offspring, is accompanied with less happiness and less fidelity; is, in fine, less of an institution than formerly. The more artificial attractions of this world have supplanted it.

Dr. Allen's remedy is in an attempt to revive the family spirit again. As the foundation of Church and State, as the institution by which good citizens are made, its preservation, he truly asserts, should be jealously guarded. The clergyman and moralist, the statesman and, by no means least, the physician are urged to use their influence to prevent this physical and family deterioration, which, although perhaps exaggerated by some, unquestionably exists.—*Editorial in Medical Record.*

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## ARTICLE IX.

### *Case of Interest.*

Dr. Rich, of New York, describes the following interesting case: "The subject was a daughter of an eminent physician of this city. Her teeth had been continuously under my care from childhood. She grew up a fine, healthy, robust girl, with large, regular, fine teeth, which she kept in good order and was very proud of. When she was about twenty years of age she complained of an occasional severe pain in the right superior first molar. She consulted me about the trouble the tooth was giving her, and I made a careful and thorough examination of the offending member, but could not discover any cause for the pain she was suffering. The tooth was perfectly sound,

not a speck of decay about it, and not at all sore to pressure and percussion. The application of a current of electricity gave no indication of a dead pulp. The intervals between the periods of suffering became shorter, and within six months after its appearance it became continuous, and the torture from it was almost unbearable. She could not sleep except when under the influence of narcotics; she became extremely nervous and irritable, and the derangement of the system was general. She lost her appetite, and ran down in health and flesh very rapidly, and her condition became a source of great anxiety to her family. During all this time she was under the care of her father, a most skillful physician, who tried every means available to relieve her and enable me to save the tooth. The symptoms were something like those that occur when there are osseous formations going on in the pulp, and with the idea that possibly that may be the cause of suffering, I destroyed and extirpated the pulp; no such formations were found in it, and no relief followed the removal of the pulp. I then extracted the tooth. The pain and nervous irritation immediately disappeared and the patient rapidly recovered her health and good looks. When I looked at the tooth after taking it out, I found a part of the ruptured membrane was still attached to the palatal root; upon examining this under the microscope, I discovered three points of inflammation in different parts of the membrane that remained on the root, about the twentieth of an inch in diamettr. With this exception, the membrane had the appearance of being strong and healthy, and except in those spots, was entirely free from inflammation. From some previous experiences, these spots of inflammation, the general character of the case, suggested spicules in the socket. The day after the tooth was extracted, I made a very careful examination of the socket, and found not only the three that corresponded with the points of inflammation but discovered with the microscope a number of other small spicules in that and the sockets of the other roots.

A few months after the extraction of the tooth I have just mentioned, the same symptoms were developed in the first superior molar of the left side. In the case of this tooth, as soon as the symptoms were well ascertained to be identical with those attending the commencement of her suffering, the tooth was extracted, as the patient would not undergo repetition of the torture experienced with the first one. And by this process this young lady has lost four of her upper molars during the last five years, the first and second molars on each side. As yet, none of the other teeth have been affected in that way."—*Odontological Society of New York.*

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## ARTICLE X.

### *Cancer of Tongue—Removal of Entire Organ.*

N. W., aged 49, was admitted, giving the following history: Has for years indulged freely in spiritous liquors, and used the ordinary clay pipe, being an inveterate smoker. He has also been in the habit of tasting tea. No history of syphilis or suspicious ulceration of the mucous membrane of the mouth can be obtained. Some years ago he broke the first molar tooth of the right side, leaving a sharp point, which constantly irritated the side of the tongue. About the month of March, 1880, he first noticed a small pimple on the floor of the mouth, under the right border of the tongue; this was cauterized, and apparently disappeared. Some months later, a small indurated mass was felt in the situation of the pimple, and now the decayed tooth was extracted. On the 10th September, 1880, Dr. Roddick removed with scissors the nodular mass, together with a portion of the side of the tongue. From this operation the patient appeared to recover perfectly, and did not come under observation again until June 9th of this year.

On admission, the patient appeared in good health; no evidence of cachexia. On examination, a lump of about

the size of a pigeon's egg is felt in the vicinity of the original induration, but involving two-thirds of the lateral half of the tongue, and interfering very much with the movements of the latter, preventing its protrusion beyond the line of the teeth. The submaxillary gland of that side is also enlarged.

*June 13th.*—The patient being etherized, and a ligature passed through the point of the tongue to control it, the operator proceeded with scissors to separate the organ from the floor of the mouth, cutting widely, especially on the right side. Nunnelly's incision was then made in the middle line, between the chin and hyoid bone; through this the chain of the ecraseur was carried and made to encircle the tongue as far back as possible, being kept in position by means of a long needle transfixing the organ. The entire tongue, with diseased portion, was then readily removed, an interval of a quarter of a minute being made to elapse between each click of the ecraseur. The hemorrhage was trifling. As a precautionary measure, a ligature was passed through the stump and held to the cheek by means of adhesive plaster. This was intended to be utilized in the event of hemorrhage or other emergency. The enlarged gland was subsequently removed by means of an incision along the margin of the jaw. A large drainage tube was passed through the opening, so as to facilitate the removal from the floor of the mouth of saliva and other discharge.

The treatment for some days consisted simply of the application of ice to the stump and the administration of small quantities of milk by means of a spoon. A mouthwash containing carbolic acid and glycerine was used throughout.

The recovery was uninterrupted, and the patient was discharged cured on the 27th day. He was seen on the 31st of July, and could make himself readily understood, although there are many words in which th e dentals predominate, which he cannot pronounce. The disease was

found, on microscopic examination, to be schirrus cancer. —*Dr. Roddick in Canada Med. and Surg. Journal.*

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## ARTICLE XI

### *Syphilitic Deformity of the Teeth.*

Before the Odontological Society of Great Britan Mr. Ackery showed two cases of unilateral syphilitic deformity of the upper central incisiors ; in each case the left central showed the typical notch while the right was normal, which possessed some interest as an usual occurrence, since since nearly all syphilitic manifestations are bilateral. Mr. Coleman presented a model of a case in which there were two supernumerary centrals of distinctly syphletic type, while the proper centrals, which were coming down within the arch, were well formed. The patient presented other evidences of syphilitic taint. Before a meeting of the same Society (*British Medical Journal*) Dr. B. W. Richardson read a paper on "The Causes of Dental Caries, Constitutional and Local." For some years he has kept a record of the condition of the teeth of all patients that came before him. He found that, of over four thousand persons, of both sexes and all ages, over eighty per cent. were affected more or less severely with dental caries ; while it was rare to meet with a person in whom both sets of teeth were altogether free from the disease. The two general causes which he believes to be chiefly responsible for this condition of affairs are hereditary syphilis and dyspepsia. With regard to the first, he quoted the statements of Professor Gross and Dr. Holland, respectlng the prportion of the adult population of the United States and Great Britain, respectively, who acquire the primary disease, estimated in each case at about one in eight. Contracted in adult life syphilis does not materially affect the teeth ; but the hereditary constitution bequeathed by it is undoubtedly indicated in the next generation by disease of

the teeth, and by a constitutional condition in which caries is readily developed. It is hard to say whether dyspepsia should be placed before or after syphilis in point of importance.—*Medical Times and Gazette.*

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# EDITORIAL, ETC.

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*Physical Diagnosis.*—The diagnosis of pathological conditions in certain tooth troubles is often obscured by inability on the part of the patient to point out the offending member. The greatest assiduity and acuteness is called for on the part of the dental practitioner to avoid mistakes. In illustration of this, not long since a remarkably careful operator removed a large filling from a superior bicuspid on account of supposed dead pulp, but on drilling beyond the cavity unmistakable signs of vitality were manifested. Yet there was a fistulous opening in the alveolus opposite the apex of the root of the suspected tooth. Careful exploration revealed a necrosed plate of alveolus, the cause not discernable, and with its removal the trouble ceased.

The following method has been helpful in cases where there was manifest trouble but difficult of location. Place the tip of the finger against the side of the tooth most distant from the operator; rap upon the tooth with the end of an excavator. The sense of touch will sometimes enable one to detect looseness in the tooth when ordinary signs fail. It is like pulse diagnosis, requiring cultivation of touch. Something may be done with exastosed roots of teeth in the same way.

There is a good book by Hilton of England, on the "Influence of Rest in Pain,' which contains some practical lessons in diag-

nosis which are well worth study. The principles he lays down are in many cases applicable to dental practice. It will pay to read this book, and it is a cheap one.

In connection with this subject of diagnosis the writer saw a few days ago what appeared to be a bad abscess, at the root of a lower inscisor. But as the tooth responded to the usual tests for vitality careful examination showed that salivary calculus was the cause of the ulceration.

Occasionally we see the tips of roots of teeth partly protruding, the tooth still firm. To amputate these protruding ends is a neat operation, and often successful, Also amputation of roots of abscessed teeth has proven successful. This if practicable is better than extracting and replacing; with either spray and the dental engine the operation might be brief and comparatively painless.

J. B. Hodgkin.

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*Handpieces* for dental engines are and have been the most vexatious of all appliances connected with modern dentistry. At least such is the experience of the writer. He has run through with most of the handpieces since the first crude "Morrison" came out, though it is certainly true that the newest handpiece is a delightful thing. From the first we have felt that the "chuck" handpiece was the ideal, and ought to be, if properly constructed, superior to any other. Lately Mr. Geo. E. Hodge, of New York, has manufactured a handpiece on the "chuck" style, which after some months use, by self and others seems the nearest approximation to "the thing" we have seen. It is so very simple in its construction it is hardly liable to get out of order, which has been the bane of all the "chuck" handpieces, and its carrying of the bur is certainly steady to perfection. At first it seems a little clumsy but with use this feeling passes away, and the bur is changed as quickly as with any of these devices. The principle on which this handpiece is constructed is certainly the true one, and its merits will tell in the long run.

J. B. Hodigkn.

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*Illness of Dr. Marshall H. Webb.*—The many friends of Dr. Marshall H. Webb, will be pained to know that he has been

lying seriously ill for a long time at his home in Lancaster, Pa., and that his condition at the time of this writing is deemed critical. It is earnestly hoped that these apprehensions may prove groundless, and that the "little Doctor" may be soon with us again, in health.

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# MONTHLY SUMMARY.

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*Hemorrhage and Gangrene from a Carious Tooth.*—In the St. Louis *Medical and Surgical Journal*, Dr. William A Byrd reports the following case: He was called to see a boy between seven and eight years of age who was suffering from gangrene of the left side of the face and neck, accompanied with severe hemorrhage. The child was very anæmic, with the left side of the face swollen, with an opening that would admit the point of a finger, opposite the submaxillary gland, another in the meatus auditorious, and another in the mouth opposite to the outside of the first molar tooth; from all these openings was flowing a dark, very offensive fluid, mixed with arterial blood, and also shreds of gangrenous connective tissue protruded from them. For some weeks the child had suffered from an offensive discharge from the left ear; and about two weeks before I saw him the first left molar tooth commenced aching and the jaw to swell. Subsequently a black spot appeared opposite the tooth, and at this spot the skin gave way giving vent to a dark, very offensive discharge. The swelling

from the ear and the tooth coalesced and the abscess broke into the ear and mouth, causing a profuse discharge from each. In a day ot two blood was freely discharged from all three openings. The patient was etheaized, and it was discovered that the bleeding came from so many points that it would be impracticable to secure all of them without too great a loss of blood and shock to the patient. It was, therefore, decided to ligate the common carotid, which was done with catgut. Through the incission a great quantity of gangrenous matter was removed as high as above the zygoma and down nearly to the clavicle. The cavity was carefully washed out with a solution of boracic acid and packed with oakum soaked in eucalyptol and vaseline. He ralied well and seemed brighter, but sank again, and died on the second day. Dr. Byrd thinks that the carious tooth was the origin of the trouble, and that if it had been attended to in time ths result would most likely have been different.

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*The Dental Engine Modified for Surgical Use.*—Dr. Garretson, of Philadelphia, in an illustrated article (*Annals of Anatomy and Surgery*, March, 1882), describes a new mechanical adjuvant for surgical operations, which seems calculated to give great assistance in a certain class of operations, where the parts are difficult of access or a special nicety is required that is hardly to be obtained with the ordinary instruments of the surgeon's armamentarium. This appliance is in reality nothing but a modified dental engine, and those who have seen the latter in use can readily understand the mechanism of the former. For the wire cable of the dental engine is substituted a stell arm. An assistant turns the crank of the surgical engine, while in the dental the foot upon a treadle gives the propelling power. The engine, of which the best is Bonwill's, of Philadelphia, is supplied with instruments of various forms, such as circular saws, rose drills, bits, etc. The rapidity with which it accomplishes the object may be appreciated from the fact that an instrument can be made to make fifteen thousand revolutions in the minute. Dr. G. finds the engine is especially suited for removing neecosed bone, exostoses, carious portions of shafts, segments of the coccyx, in exposing the zygomatic and sphenomaxillary fossæ, and for trephining.—*Med. Record.*

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## ARTICLE I.

### *American Dental Association.*

The twenty-second annual meeting of the American Dental Association was held at the Highland House, Cincinnati, August 1, 2, 3, and 4, 1882, Dr. H. A. Smith, of Cincinnati, in the chair, and Dr. George W. Cushing, of Chicago, Secretary.

Dr. A. Berry, the oldest dental practitioner in Cincinnati, delivered an address welcoming the Association to the Queen City of the West, which on account of the modesty of the President, was responded to by the First Vice-President, Dr. W. C. Barret, of Buffalo, N. Y.

Drs. Field, Buckingham, and Taft were appointed a committee to draft suitable resolutions on the death of Dr. D. Hawxhurst.

Drs. Crouse, Shepard, and Pierce were appointed as a committee to draft resolutions on the death of Dr. M. S. Dean, of Chicago.

On motion of Dr. Barret, the Secretary was instructed to send the sympathies of the Society to Dr. Marshall H. Webb, of Lancaster, Pa., who is lying dangerously ill.

FIRST DAY.—AFTERNOON.

The President, Dr. A. H. Smith, of Cincinnati, read the annual address, of which the following is an abstract:

After eulogizing the talents and social qualities of the late Dr. M. S. Dean, of Chicago, he said, in his address last year the President had called attention to the fact that etiology—the science of the causes of dental caries—had been almost wholly neglected by essayists who had contributed to the proceedings of the Association, and suggested to the section embracing etiology that a committee be appointed for the object of making a careful, systematic study of the causes which contribute to the existence of dental caries. When it was considered that much the larger proportion of their time spent in actual practice was occupied in the treatment of lesions caused by the almost universally prevalent disease, which were denominated dental caries, and that notwithstanding the subject had been extensively studied, the fact confronted them that the efficient cause of dental caries was still a matter for speculation, it was noteworthy, as well as encouraging, that the subject received so large a share of attention before the section devoted to the consideration of diseases of the teeth at the International Medical Congress, held in London last year. With the view of stimulating investigation in this direction, he would respectfully suggest that the Association offer a prize to members, of not less than $200, for the best paper based strictly upon original investigation relating to etiology of dental caries, the award to be made and announced at the annual meeting in 1884. If there was any deficiency in the treasury for that purpose, it might be met by an increase in the annual membership fee, or the whole amount may be made up by voluntary subscription of the members. Whether dentistry should be taught in special colleges or in a regular university course with other studies, was a matter that might safely be left to time, the great arbiter of all things.

Dr. Wm. H. Atkinson, of New York, Chairman of Section 3, "Dental Literature and Nomenclature," read the report of that section. It was a continuation of the same subject embodied in the reports of that section for the last

three or four years. In his report he endeavored to explain a new system of language, based on the supposition that all languages were one and the same. He explained the meaning of two words, bauski and vauski, the former referring to organic esmalogy, the latter to inorganic esmalogy or biology. There were eight divisions of biology, according to the eight vowel sounds.

At the conclusion of his remarks, to which the Association had listened without understanding a word, Dr. Geo. Watt, of Xenia, O., said that the report was entirely irrelevant and foreign to the purpose of the section under which it was read, and as this was not a philological association, he hoped they would not be bored with any more such reports. So he moved the report be referred to a special committee of five to decide whether it should be published or not.

After a somewhat heated discussion by various members of the Association, Dr. George Watt arose to explain his motion. He had always been a great friend of Dr. Atkinson. Still the Doctor's judgment had been purely philological; it had not been on dental nomenclature. The society for the last four years had not been benefited by the discussion. And now came a continuation of the subject with the same animus from the same animile. There was not an original thought in the paper. Its thoughts were the vaporings of Stephen Pearl Andrews. Hence he had put his motion to appoint a committee, in order that it might be decided whether the society records should still be burdened with such useless matter. He did not care what the committee would do; whether they decided to send the essay to the Patagonians, or whether they bound it in morocco or calf—calf would be better—or distributed it for the enlightment of the people, so long as they disposed of it. Perhaps it would be better to send the paper back to its original author. However, under no circumstances could he be tortured into any feelings of disrespect against the Doctor. He was a great man, but

the subject matter was entirely irrelevant to the object of the meeting. Should it be decided to put the paper on record, he would be pleased to learn every word of it by heart.

The motion was carried, and Drs. Keely, Odell, Friedrichs, Rehwinkel and Pierce were appointed as the committee.

SECOND DAY—MORNING.

The privileges of the floor were accorded to Prof. Mayr of Springfield, Mass., who, after thanking the Association for the compliment, said: There is too much taken for granted. When I began to study the cause of dental caries I supposed that the subject had been thoroughly investigated, but judge of my surprise when I found sixty per cent. of lime salts in the carious dentine; and yet they talk of the "acid theory." It is so with other subjects as well.

Dr. C. N. Pierce, chairman of the committee appointed to investigate the merits of the paper on philology, read by Dr. W. H. Atkinson at the opening session, made the following report:

The special committee to whom was referred a paper on philology, read by Dr. W. H. Atkinson, as chairman of the section on "Dental Literature and Nomenclature," would respectfully report that they have carefully considered the subject referred to them, and are of opinion that the paper under consideration is foreign to the purpose of the section under which it was read, and that if the Association desire further communications upon general philology, that a section of that title be created; but in view of the fact that at previous meetings of this Association similar papers have been received without adverse criticism, they would suggest that this one be allowed to take the usual course, and go with other reports to the Publication Committee.

Dr. W. N. Morrisson, of St. Louis, Mo., then read a paper entitled "Some Thoughts on the Correction of Irregularity," of which the following is a synopsis:

During the whole course of his professional life he had only made one mistake in regulating teeth. In that case the patient never developed to normal size; small in statue, diminutive in physique, with large, good teeth in a small mouth, he was free to admit that she would look a little better with that part of her anatomy less prominent. But look at the thousands of cases to the other extreme. The public were clamorous for deformed mouths. The first demand was to have all teeth extracted, and have all artificial little, narrow, white teeth; second choice, about the half of their teeth extracted to improve their appearance and keep them from decaying; and thirdly to have the crowns of the remaining teeth horribly mutilated by filing and grinding.

It was a disgrace to the profession that there were so many claiming to be progressive dentists, who yielded to the demands and practiced to their requirements. A few months ago the public and a few silly snobs, through the press went into ecstasies over Patti's small mouth and beautiful teeth, while in reality it was a deformity—teeth irregular, one canine so much out of the arch that when she cast a bewiching smile, her lip sometimes caught upon it, and it was with some difficulty that she could get it down. Her profile had that sorrowful, dinged-in appearance so common at this time. Several years ago the papers had given an account of the selection of a characteristic American female head by the designer of the new silver dollar, that should accurately represent the correct type of American beauty. He did not know the lady, nor her dentist, nor did he have any information in regard to the condition of her teeth or articulation; but seeing her face upon the few dollars which had passed through his hands, he would venture the assertion that her mouth did not contain thirty-two normally formed teeth. In treatment of cases the great difficulty was to control the patients and parents. Teeth were easily moved if the force be applied in the right direction, but they are as easily returned

to their old places. He therefore had decided objections to all of the complicated apparatus, and these were obviated by his system of regulating with screws and levers and rubber ligatures, which were secured to the teeth by thin annular bands or ligatures of platinum, cemented to the teeth with oxyphosphate of zinc, where they remained until the operation was entirely completed.

Dr. W. H. Atkinson regretted to see so little inclination to discuss the paper. There were a good many aphorisms in it that were orthodox and in accord with nature with few exceptions. The screw should never be used to move a tooth; a very slight force, constantly acting, is all that is necessary. There is a dearth of knowledge in regard to regulating teeth. The constant irritation of a tooth is wrong. We are now able to do in weeks what formerly required months. After we get the teeth in position, most of them will stay there without retaining plates. The idea of giving a patient a plate with screws, levers and watch keys was an abomination. The speaker then proceeded to illustrate his method, which consisted of a thin band of iridium and platinum, which extended around the anterior teeth and had its extremities cast in a plate of Reese's metal, said plate extending over the grinding surfaces of all the molars, and having depressions for the articulation of the molars of the opposite jaw. The speaker concluded by emphatically saying that this is *the* way of regulating teeth.

Dr. C. N. Pierce, of Philadelphia: That may be *the* way of regulating *some* teeth, but there are many cases in which it is no more applicable than it would be to the sole of the foot. All cases cannot be treated alike.

Dr. Shepard, of Boston: Did I understand Dr. Atkinson to say that the plate was never removed for cleansing from the beginning of the treatment to the end?

Dr. Atkinson: Yes, the plate is not removed at all during treatment.

Dr. Shepard: Any appliance that cannot be removed and cleansed by the patient is not a good one. Such plates *can* be made. One defect in Kingsley's "Oral Deformities" is that in two hundred pages on this subject there are only three lines on cleansing the regulating apparatus.

Dr. McKellops, of St. Louis, spoke of Dr. Coffin's method of employing piano wire. An impression cup is fitted to the mouth and gutta-percha, previously softened in hot water, placed therein. The cup and contents are then immersed in cold water for a few seconds, introduced into the mouth, pressed into position, allowed to remain a few moments, withdrawn and placed in cold water, to allow any part that has been disturbed on removing the cup to resume its proper shape.

A plaster model is made in the usual way and sheet wax spread over it, covering the molars. A piece of piano wire, 15 gauge, is then bent in the shape of a written letter *m*, with the initial and terminal stroke lengthened these ends are flattened, but *never heated*. The wire is immersed; in a solution of chloride of zinc and then dipped in melted tin, this coating preventing the sulphur attacking the wire. The ends of the wire are imbeded in the wax, and the whole thing vulcanized, finished up and fitted into the mouth. After the plate had been worn a few hours, the plate is to be cut through the median line with a fine saw and the parts spread apart somewhat, and make a thick plate and insert a piece of sea-tangle and depend on its expansion to move the tooth. I often have patients come to me with the first molars wholly demoralized, and in such cases I remove them, but do not find that the second molars tip, but that they come forward and fill up the space.

Dr. C. N. Pierce, Philadelphia: Economy of time and simplicity of appliances are of much importance. In regulating retreating upper incisors I take a piece of platanized gold, twenty-four gauge and about one-sixteenth of an inch wide, and make each end pointed. I then drill a small hole in the tooth to be moved and one in the first molar and spring this

piece in place. It is not in the way as it lies along the lingual surfaces of the intervening teeth. If the tooth does not remain in position a retaining plate should be made. The strip of gold should have a hole drilled near one end so that it can be tied in to prevent its being swallowed. The small pits can be filled after the teeth are regulated.

Dr. I. N. Crouse, of Chicago, cites a case of contracted arch in the lower jaw that he had succeeded in expanding by means of jack screws.

Dr. B. G. Marklein, Milwaukee (to Dr. McK.): Are these plates as good for drawing teeth in as for forcing them out?

Dr. McKellops: Certainly; I have just passed a plate around illustrating that.

Dr. Marklein: In a case where the only anchorage to be had is the second superior molars, is that sufficient for drawing back the other ten?

Dr. Darby: In such a case I would wedge the bicuspids back and then draw the incisors and canines into place.

Dr. Morrison: The original Coffin plate was one with dove-tails opposite the teeth to be moved, in which were inserted pieces of wood, the expansion of which moved the teeth. I have made quite a number of these plates and accomplished good results with them, but I offer in my paper a substitute for so many appliances that require ligatures.

### SECOND DAY—AFTERNOON.

The committee on resolutions, in reference to the death of Dr. D. C. Hawxhurst, reported a paper which was ordered spread upon minutes. It recognized the capabilities of the deceased, and stated that he died when he had before him a greater sphere of usefulness. The heartfelt sympathy of the Association was tendered to the stricken wife.

Dr. A. G. Rawls, Lexington, Ky., then read a paper on "Pulpless Teeth," (which, owing to the peculiar and rapid delivery of the speaker, I was unable to report.—*Reporter.*)

Dr. Harlan, of Chicago, read a paper on the "Treatment of Alveolar Abscesses," in which he advocated the use of hydrogen peroxide and gave his mode of preparing it, saying that he preferred an etherial solution to an aqueous one, as it was more stable.

Prof. Mayr: I have met with many persons who make use f the term vis vitæ, and yet I have not heard any one define it.

Dr. Rawls: It is a mysterious force.

Dr. Mayr: It is a mere empty word I would like to know ıst how much vis vitæ is exerted. In regard to hydrogen eroxide, I suggested some time ago that it might be used as a leaching agent, but the trouble is to apply it. We must first nswer the question, "what colors a tooth," before we decide n a bleaching agent. There is, however, a diversity of opinon on this point. I believe it is due to hæmatine in some form. he antiseptic properties of this compound are due to the zone liberated on decomposition of $H_2 O_2$.

Dr. L. C. Ingersoll, Keokuk, Iowa: I have written several apers on this subject and I wish to call attention to ulceration hat begins at the apex and extends to the neck. I venture to y that no pulp dies spontaneously without affecting the perinntal membrane. What called my attention to this lesion was e extracting of a tooth that I had failed to cure and finding bout one fourth of an inch of the apex covered with calculus. he query was where did it come from? I did not have it nalyzed. It is not found in connection with alveolar abscess, ıt with alveolar ulceration. All the ingredients found in callus exist in the blood, and that is my reason for calling it nguinary calculus.

Dr. Pierce: Do you find the process broken down in such ses.

Dr. Ingersoll: Yes, and that may be the source from which e calculus is derived, but I do not believe it to be the chief urce, as the amount of calculus is far greater than that of the oken down process.

Dr. Pierce: I wish to endorse the views of Dr. Ingersoll in gard to the source of calculus.

Dr. Friedrichs, New Orleans (to Dr. I.): How many cases ve you met with?

Dr. Ingersoll: I saw a good many cases before I knew what ey really were. Since that I have had some eighteen or venty cases.

Dr. Morgan, Nashville: Do you not find it in the so-called iggs' disease.

Dr. Ingersoll: It is one of the most prominent characteristics of Riggs' disease.

Dr. Rawls: There are two ways by which inflammation can take place in the tissues surrounding such teeth. It is due either to some external cause that dips down from the outside, or to one that cuts off all nutritive material. The source of calculus is no doubt the one to which it is attributed. No part of the body is exempt from such deposits, but they occur only on free surfaces, and they can only occur in tissues in which an opening has been caused by inflammation. I do not consider it a result of Riggs' disease, but a concomitant of the breaking down of tissue from mercury, etc. We are in the habit of teaching our patients that we can save such teeth, that we can cause healthy tissue to grow over dead tissues and expect such live tissue to lie in contact with it when it is not possible.

Dr. Watt: We have been blundering over salivary calculus till Dr. Ingersoll gave it a name. There was a sanguinary calculus weighing thirteen ounces taken from the abdominal muscles. It is only necessary to have a nucleus and it will grow. I am unable to say what caused the calculus, but it is possible that it is due to inflammation, a portion becomes dead and a portion of the blood is dropped. As long as saliva holds free $C O_2$ in solution it holds the various salts in solution, but if the $C O_2$ is not present in sufficient quantities the salts are deposited. Whenever ammonia is present it is apt to unite with the $C O_2$ and a deposit results. The same effect is produced by alkaline mouth washes. Ammonia arises from a general breaking down of tissues, it sometimes comes from the mucous follicles, but more commonly from the breath.

Dr. Ingersoll: When we consider that the blood contains all the ingredients of calculus and that calcareous degenerations are very common in all parts of the body, it does not require a very great stretch of imagination to believe that this is sanguinary calculus. The ingredients of salivary calculus exist in the blood before they got into the saliva. The only case I saw where there was drainage was the case of one-fourth inch of the apex incrusted with calculus that I mentioned.

Dr. T. L. Buckingham, Philadelphia: It is very easy to build up a theory, but it should be founded on facts. Whenever you

ave a solid dead nucleus, bullets, splinters, etc., you have a eposit on them. $H_2$ $O_2$ unstable, and when it is decomposed ascent oxygen is liberated which acts directly on the tissue, it in the form of ozone which is a molecule of three atoms. For everal years I have been using a formula of Dr. C. E. Kirk, of hiladelphia. It consists of sulphate of soda and borax ground gether. This is inserted into the tooth for bleaching purposes.

The borax decomposes the sulphate of soda and liberates ulphurous acid, which has quite an affinity for oxygen and thus ecomposes the coloring compound; it has the advantage over hlorine of going to a greater depth. It is more permanent and imple.

Dr. W. H. Morgan, Nashville, Tenn: I think that there are o layers of periosteum in the sockets. There is no such hing as perfect success in the treatment of such cases. I think is absurd to talk of pus secreting surfaces. They can only ake from the blood what is in it, and pus does not exist in the lood.

Dr. Atkinson said he was sorry that as a body they were geting as crazy and "Atkinsonian" as himself. They were all roubled by an ignorance of the laws of terminology. What as ulceration but the breaking open of an abscess? What as suppuration but an inflammation, and inflammation an xydation? He blessed the Lord that the ladies wore their air long, because they retained all their inspiration. He beeved in vis vitæ, and that all power came from God.

[TO BE CONTINUED].

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## ARTICLE II.

### *The Lancet in Dentition.*

BY THOS. S. SOZINSKEY, M. D., PH. D.,

It is noted by Southy, in his common-place book, "The Doctor," that "Rogers, who had been about the person of Charles the Second, died at ninety-six, in cutting his teeth.

He had four, and many more were coming, which so inflamed his gums that it proved fatal." Poor old Rrogers!

"Cutting of the teeth" is, rightly or wrongly, credited popularly, with the destruction of many lives, and it would seem from this case that it is liable to be accused of being at work even in the terminal stage of existence. In the nursery it has always, perhaps, been regarded as a very serious matter. Nevertheless, this common belief, like many another, may not be well founded. Cumulative tradition has possibly served to, at least excessively emphasize the balefulness of the process. It may, however, be taken for granted, I believe, that the amount of suffering experienced by children in general while getting their primary teeth is very considerable. It causes decided uneasiness in almost all, and decided danger in some. If it rarely or never destroys life directly, it certainly not unfrequently does indirectly. But I am not sure that it is entirely wrong to give it as the actual cause of death in not a few cases. This is at any rate done. In Philadelphia, about thirty deaths are attributed to it, on the average, yearly, in the bills of mortality. During the census year ending June 30th, 1870, there were three thousand two hundred and forty-seven deaths attributed to it in the United States. There is assuredly some ground for the prevailing belief that dentition is the direct or indirect source from which flow many of the ills and a large share of the mortality of babies.

It would appear, however, that there are some physicians who seriously regard the coming of the teeth as an extremely innocent matter, doing, as they say, a purely physiological process. I would advise such that it is assuming a great deal to take it for granted that dentition is in all cases a purely physiological process. Perhaps in no child is it absolutely physiological; it is at best only approximately physiological. In a recent address, Dr. B. W. Richardson went so far as to declare that he "had never seen a healthy child," never one "that had not in

either some actual or latent constitutional disease." At ny rate, there is good reason for believing that in a large roportion of children, especially in large cities, dentition of decidedly pathological import. As is true of many ther troubles, it generally tends to be more marked in proortion to the degree of unhealthiness of the child. And t it be borne in mind that the sensibility of all infants is reat, and of some sickly ones such that even a trifling ritation may be followed by serious constitutional and ther effects.

But it is not my purpose to speak of the subject of dention. This has been done very well in a lecture published this journal recently. It may be well, however, to say, the words of John Hunter, in his admirable treatise on he natural history and diseases of the teeth, "the sympoms are so various in different children, and often in the ame child, that it is difficult to conceive them to be from he same origin, and the varieties are such as seem to be eyond our knowledge."

Now, when to the discerning senses of the observing ensible physicians a child is suffering severely from the ruption of one or more teeth, relief should, of course be rocured as soon as possible. How is this end to be ttained? The advice given by many amounts to little nore than to use a soothing-syrup—a la Winslow—of some ort. Meeting the various indications is, in truth, in numrous cases, far from being an easy matter. Such measures s serve to favor the general health are particularly indiated in every case. Careful regulation of the diet, daily athing and a fair amount of exercise, especially in the pen air, are among the items of great significance. Make he process as little pathological as possible by making the condition of the child as physiological as possible. Anodynes, antacids, febrifuges and other remedies, including local applications, may or may not be called for. But I believe the remedy most imperiously called for, in at least bad cases, lies in the use of the lancet.

Of the use of the lancet in dentition it is curious to observe how different are the opinions entertained. Some do not hesitate to say that it is of no value. Thus, in a recent widely circulated work on the diseases of children, by Dr. Henoch, a Berlin practitioner of seemingly large experience, it is said: "It is now generally held that every attempt to facilate the eruption of the teeth, and thus remove the symptoms due to difficult dentition, is absolutely useless. I have in earlier years performed sacrification with sufficient frequency to convince myself of its entire inutility; and it even appears to me that the cicatrix formed may increase the difficulties connected with the penetration of the teeth." Here is what Dr. J. Lewis Smith says on the subject, in his work on the diseases of infancy and childhood: "The gum-lancet is now much less frequently employed than formerly. It is used more by the ignorant practitioner who is deficient in the ability to diagnosticate obscure diseases, than by one of intelligence, who can discern more clearly the true pathological state. Its use is more frequent in some countries, as in England, under the teaching of great names, than in others, as France where the highest authorities, as Rilliet and Barthez, discountenance it. . . . I know no accidents of dentition which require prompt scarification, except suppurative inflammation of the gums, convulsions, and paralysis. In other cases the operation may be safely postponed till other measures have been employed." In Drs. Meigs and Pepper's treatise on the diseases of children it is said: "Lancing of the gums is undoubtedly a most important point in this [laryngismus stridulus] and other diseases of childhood connected with dentition. We have long been convinced, however, from personal observation, that a resort to this operation merely because the child is passing through the period of dentition is at least useless. We have never found it to do any good unless the teeth are near enough to the surface to produce manifest swelling, attended with heat and soreness of the gums. So long as

gum is hard, insensible, not turgid, and of ts natural
r, and the mouth not hot, cutting has done no good."
at wise old master of the healing art, John Hunter,
r speaking of symptoms arising from dentition says,
o far as my experience has taught me, to cut the gum
vn to the teeth appears to be the only method of cure."
'ruly the authors quoted from differ sufficiently as to
value of the lancet in dentition. It is worth while to
ell a little on what they say.

)r. Henoch speaks very rashly to say the least, in
laring that "it is generally held that every attempt to
litate the eruption of the teeth is absolutely useless."
e idea was not formed from an extensive acquaintance
h the literature of the subject. Again, the statement of
Doctor as to his experience with the use of the lancet
y well lead one to infer that he has had hardly any
perience with it. He is like those who, although having
knowledge of the use of the lancet in general medicine,
unhesitatingly venture to condemn it. What he has to
about "the cicatrix" may rightly produce the impres-
n that be has not made himself master of the subject.
the lancing is properly done, there need be no cicatrix;
l if there be one it will not serve to retard the "penetra-
n" of the tooth. As Hunter long ago said, at the point
cicatrix the gum offers the least resistance to the appear-
ce of the tooth.

Dr. Smith is doubtless right in holding that ignorant
ctitioners are very apt to use the lancet when not
uired, and in his intimation, that the use of it is largely
natter of fashion. But I am also quite sure that too
ny practitioners who are usually regarded as intelligent
not use it as often as they should. His statement that
"knows no accidents of dentition which require prompt
rification, except suppurative inflammation of the gums
vulsions and paralysis," is a trifle extraordinary. What
cases of, say, larynigismus stridulus and of cholera infan-
m, in which dentition bears largely a causative relation?

Except in the diseases he mentions, the Doctor would postpone the operation "till other measures have been employed." It scarcely follows from this that he is acquainted with the cardinal principle of sound medical practice. In treating of the same subject, Hunter correctly remarks, "It would be better at once to remove the cause than to be attemping from time to time to remove or palliate the effect." Wasting time trying to palliate effects, while the cause is allowed to act, lets many a little innocent go unnecessarily and speedily into the grave.

Drs. Meigs and Pepper "have long been convinced, from personal observation, that a resort to the operation merely because the child is passing through the period of dentition is at least useless." It is rather strange that they were ever otherwise than 'convinced.' No sensible physician cuts a child's gums indiscriminately. Resorting to the lancet when there is no evident need for it, no matter how the child is affected, is, as Dr. West fitly says, "barbarous empiricism." The idea that it is the approach of the teeth "near to the surface" which produces the troubles which are met with in dentition is not of necessity a truth. At least the main source of trouble in the appearonce of a tooth is not at the surface; it is at the base. The backward pressure on the sensitive nerves and other parts give rise largely to the pain and irritation about the gum. This backward pressure may set up trouble a considerable time before the tooth nears the surface, the tension then being almost or quite as great as later. In fact it often, or perhaps I should say generally, happens that there is a spell of trouble some time before the tooth is about to make its appearance. In some it is very marked and it may be repeated. The capsule becomes distended and the surrounding parts hyperæmic and painful, and there is a free flow of saliva. In any case where there is evidently decided irritation about the gum the lancet should be used. It should be used even if for no other reason than to relieve the child of local pain, of toothache, an

iction which, as many know, and Burns told in expres-
e poetic phrase, is something awful enough in itself, a
n which at its worst Bacon had reason in believing to be
ne of the sharpest of pains." There need be no hesi-
cy in using the lancet repeatedly if the gum is at any
nt tense and angry looking. Says Hunter, "I have
formed the operation about ten times upon the same
th, where the disease had recurred so often, and every
e with the absolute removal of the symptoms."

'hat the lancet will afford relief in the presence of very
rked symptoms every one surely is aware who knows how
ise it. It is an instrument by which much may be done
essen suffering, cure disease and save life. Here is a
icate child, somewhat over a year old, languid, pale, the
im of one or two convulsions, with contracted brows, a
perature of from 101° to 102°, a tendency to diarrhœa
a slight bronchitic cough. I lance his cutting tooth,
within a few hours he is almost entirely well. I have
e the thing so often in his case that I know precisely
at the result will be. This lymphatic child of fifteen
nths has a developing croup; the hurried breathing, the
se in the throat and all the other symptoms are becom-
decided. I lance his appearing eye teeth and he begins
nediately to get well. There is a strong looking boy,
rly two years old, with a temperature of 103°, and a
rked cold on his chest. I prescribe appropriate reme-
s but at the end of two days he is no better. I lance a
r of coming molars, and next day there is no fever
rdly, and the cough speedily vanishes. That poorly
ed for child, who has about completed her first year, is
dently, from the high fever (103.5°), nausea and tend-
cy to diarrhœa, drifting into the fatal grasp of cholera
antum, the midsummer heat favoring the development
that serious infantile disease. I look at her mouth and
d that the gums over both the eye, and the stomach-
th are tense and angry looking. I lance these points,
d very simple measures restore the patient, within forty-

eight hours, to her usual state of health. But I need not give an extended recital of cases. I am of the opinion that early, and, if need be, repeated lancing would save many who should otherwise perish from convulsions, bronchitis, cholera infantum and other diseases. Especially in spent children, in the warmer part of the year, should there be no delay. Statistics of the census year ending June 30th, 1870, show that there are more deaths attributable to dentition in the third quarter of the year than in the two preceding ones together, and many more than in the first and fourth together. The Philadelphia bills of mortality present a very similar showing.

In order that lancing the gums may do as much good as possible it must be done well, but, of course, not butcherly. A plain incision with a very sharp lancet is not enough; it will generally do only a little good. This is what is not uncommonly done. Let there be several more or less irregular incisions made, with a somewhat dull lancet, and the hoped for result will very certainly follow. In bad cases the gum should be very thoroughly scarified, so thoroughly that there will be little or no likelihood of the parts uniting over the tooth. And it is proper to extend the incisions well to the sides of the coming tooth. This may be called for after the tooth has partly appeared. Whatever bleeding occurs will be beneficial; it will serve to relieve the hyperæmia and pain. In fact, in not a few cases it is the bleeding that is principally called for; local depletion affords immediate relief. It will not be harmfully profuse, likely, in any case. Says Hunter, "I never saw a case where the bleeding proved either inconvenient or dangerous.

What harm may result from lancing the gums, under any but very extraordinary circumstances, it would be hard to state. I do not feel sure that it can do any, and in this belief I am fortified by the opinions of perhaps all dentists and others who have carefully studied the matter. It may cause temporary pain. Still, this is not very marked.

y a child will open its mouth and have several teeth oughly lanced without giving a whimper. As for the erness of the gum, which there may be for a day or from thorough lancing, it is comparatively a small ter. The idea that lancing will retard the development ne tooth has, I believe, no just foundation. It would ear to be based on the erroneous notion that when lancs practiced the tooth should immediately appear. It is able that in no case is there any more than an apparent y. As already stated, the irritation about the gum h calls for the use of the lancet may arise weeks before tooth approaches the surface. A tooth does not receive nourishment from the structures above or about its n. The cicatrix and hemorrhage I have already en of at sufficient length. In all proper cases the et may, then, be used, with confidence that it is a edly non-injurious, as well as an almost infallible ns of relief.—*Med. and Surg. Reporter.*

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## ARTICLE III.

### *Erosion: The Probable Causes and Treatment.*

BY J. J. BAILEY, L. D. S. EDIN.

per read before the Students' Society of the National Dental College.]

r. PRESIDENT AND GENTLEMEN.—The subject to which uld ask your attention for a few minutes this evening e which has not, I think, been brought before this ety for a considerable time. It is with little hope of g justice to the subject that I have undertaken to say v words concerning Erosion, but rather because I feel there are many here who are interested in this ques- , and the benefit of whose opinions I shall be glad to .

he disease which we term Erosion, does not seem to received the attention which its frequency, and the c it causes, demand. I think the opinions of nearly all

writers on the subject will be found in a paper read by I Coleman before the Internation Medical Congress, 18 and from which I have made several extracts. The earli recorded notice is by Hunter, who termed it decay by d udation. After having alluded to the singular appearar these cases present as though filed and highly polished, concludes as follows, "From its attacking certain te rather than others in the same head and a particular p of the tooth, I suspect it to be an original disease of to itself, and not to depend upon accident, way in life, con tution, or any particular mangement of the teeth."

Mr. Bell, in a paper entitled "Loss of Enamel and W ing Down of Teeth," says, "The groove is perfectly strai and continuous through its whole extent, and is often re lar and smooth as if it had been formed by a fine round and afterwards polished; when the bone has been expo by this process it sometimes becomes very slightly disc oured, but remains for a long time perfectly hard a sound, and seldom exhibits any appearance of gangrene.

During a discussion at the Odontological Society, 1870, Mr. Harrison, in the course of some remarks on subject, said he at one time thought it must be due to c tain absorbents in the teeth themselves, not yet discovere but was obliged to abandon his theory on seeing an art cial lower piece presenting this abnormality. The dentu had been carved out of hippopotamus tusk, and had been the mouth about two years. On coming under Mr. H rison's notice, he found a number of transverse lines run from canine to canine. Enquiry elicited the fact that could not be due to excessive application of the tooth-bru On seeing this case, he was compelled to abandon his theory and come to the conclusion that it was, in all pro bility, produced by some peculiar action of secreti or of the absorbents, or of both, of the mucous membrane the lower lip. I have here an upper denture set with n ural teeth; and though the majority of the teeth attacked by caries, I think there are indications of Eros

eral, although some of these seem to have degenerated rue caries.

Campion is inclined to think it never occurs in ne- teeth, apparently inclining to the belief that it must ing to some vital process.

Salter, in his "Dental Pathology and Surgry," under ading of "Surface Wear," after alluding to the sim- of Erosion and abrasion, proceeds as follows, "The of surface wear may be stated to be predisposing, ting of an inherit softness of structure which cer- exists in some syphilitic teeth, and probably in other ions; and exciting causes, such as molar mastication ncisor teeth, gritty food, a hard tooth brush, certain powders, especially vegetable charcoal, which usually ns particles of silicates of lime and potash. It is prob- hat in some cases the wearing. is assited by a solvent ening action of the saliva, but the polish I believe is s occasioned by friction." He seems rather inclined to ute many of these cases to syphilis, especially those the cutting edges of incisor teeth are reduced.

Magitot considers these clean and polished notches as ng else than caries which has passed into the condition ntaneous cure or dry caries.

Coleman has arrived at the conclusion, "That the element is friction, but that the condition which per- he loss of substance thereby, is favoured by a change generacy in the tooth itself." He suggest that change be owing to fatty degeneration of the contents of the nal tubuli and the formation of a fatty acid; or, as an tion, he surmises it might result from lessening of power of resistance vaguely termed vital force. But, latter, one would expect to see it in dead teeth more in living ones, whereas he leans to Mr. Campion's view t does occur in necrossed teeth, which teeth must have eir power of resistance. With regard to the agencies furnish the friction, he says he has never seen a case ich it could not be imputed to either tooth-pick, brush, ongue or saliva.

I have endeavoured to give, briefly, the opinions of several authorities as to the cause of Erosion ; but, I imagine, with the result that, though we may believe the old adage, "In a multitude of councellors there is wisdom," we must have come to the conclusion that thier wisdom is in this case *slightly* confusing.

I have purposely left till last the opinion of one great authority—Mr. Tomes. After describing the disease, he sums up as follows, "Absorption cannot be called into account for the removal of the tooth-substance, for it often takes place at spots remote from any structure capable of developing an absorbent organ, and it seems that we must fall back upon the idea that it is an example of chemical solution. But whence the solvent comes, and why the affected surfaces are not the site of ordinary caries, are question which remain unsolved, though it seems probable that mucous, by fermentation, or affording a nucleus for fermentation, may provide an acid solvent.

If I might offer an opinion of my own on the subject, I should feel inclined to accept Mr. Tomes's theory, partly because I may possibly have found a solution of his question as to why the attacked parts are not the seat of caries. Before, however, I ask your consideration of this idea, I shall just remark on one or two particular appearances which these cases present. I do not intend to trouble you with a minute description of the disease, as that is pretty well known to all of us. I think all observers in describing the disease have agreed that these depressions may have sharp, well-defined, or even overhanging edges ; the whole circumference may slope off to the surface ; but there is one characteristic which has not I think, been remarked. It is that we may have sharp edges, but that they never extend the whole circumference, there will always be found two points, and these opposite points in which the cavity slopes off to the surface of the tooth. In other words, whatever be the shape of the cavity in one direction, sharp edges or sloping, in the other it will always be so formed that instru-

nt or point may be passed from one side across the cav-
and emerge at the other side without meeting with any
truction.

We have seen that Mr. Coleman considers the prime
nt as friction, but willing to attribute it to quite a
nber of causes, viz., tongue, lips, tooth-pick, brush,
va, etc. Now it seems difficult to think that a disease
uniform in its characteristics should be directly caused by
many agencies. I have myself thought we must try to
l some cause to which we can always attribute this affec-
. We know the tooth-brush cannot produce it in every
e, though it is undoubtedly often an important factor;
ther can the lips, tongue, etc. Mr. Coleman alludes to
action of the saliva, and, in support of that theory,
ntions the wearing away of stones by the continual drop-
g of water.

For some little time I have been observing several cases
the hope that I might possible find a clue. I have not,
the somewhat limited period, seen a very large number
cases; but, from what I have seen, I am inclined to
nk that Erosion is caused by the mechanical action of
fluids in the mouth. I would give the lips, tongue, etc.,
econdary position considering that they cheifly act as
tive powers to the fluids. There are one or two reasons
y think this to be the case.

In the first place, all cases of Erosion are in a position
bject to the action of the oral currents; for the fluids
y take such varying directions in different mouths, and
en in the same mouth. We know what a small thing is
fficient to vary the current of a running stream, and in
e manner a small cause as a slightly projecting tooth
ay be quite enough to determine the direction the fluids
ay take. An instance may be found, in say, an upper
ntral incisor, where Erosion has occurred at the neck of
e tooth in front. As the denuding process encroaches on
e tooth and gets deeper, we may see the lateral extremities
ke one or two courses; it may take on the form of caries,

in which case we shall probably find that the teeth are crowded together so that no fluid could possibly pass between them; or the Erosion may proceed round the side of the tooth, though such tooth will, I think in the majority of cases, be natually narrowed at the neck, and it will be found that there was previously a slight space through which liquid could pass. In some cases the tooth pick may have helped the process.

Secondly, the characteristic shape of the cavity is such that it will always form a channel along which fluid can passed unobstructed.

Thirdly, though all cases can be accounted for by this agency, there are certain cases which I can account for in no other way. These are some of the reasons why I incline to this view.

Though I think all this to be the mechanical cause, I of course rely upon the idea that there is a predisposing cause though it does not necessarily produce Erosion. I am inclined to think that this is the same that often precedes caries. I imagine there must be some secretion which has the power of softening and dissolving the tooth-substance, the result of which may be either Erosion or Caries. Now what is it that determines which the sequel shall be the former or the latter? Think this entirely depends on whether the attacked part of the tooth is under one or other of certain conditions. If the part is under such conditions that the dissolved substance can be easily and frequently removed, and that by liquids always moving in certain directions, then I apprehend we shall find Erosion will supervene. If, however, the part is in any way protected from exposure to cleansing influences, then the dissolved material will remain and form a nucleus of decay, in which fermentation, with its attendent leptothrix, etc., will soon appear. In short, we shall have all the appearances of caries.

We now come to the question, Why do we see the teeth in one mouth subject to Erosion, and in another mouth the corresponding teeth attacked by caries? The position of

e teeth and all natural conditions may apparently be alike
both. I think the deciding point depends upon the
tent to which the self-cleansing agencies are at work.
e all know what a vast difference there is in the cleansing
wer of our patients. We might give some glass after
ssful of water to rinse their mouths with and they would
en have hardly removed any foreign matter which might
on the teeth; while other patients' mouths would be
initely cleaner after rising with one mouthful of water.
the former case I do not think we should find Erosion;
d, with one exception, I cannot remember having seen
in such a mouth; indeed, since my attention was drawn
he subject, I certainly have not met with it, while, on
contrary, caries has been prevalent enough. Again, in
cases of Erosion which have come under my notice, the
ients have used the oral muscles to a considerable extent
one exception, before alluded to being that of a molar
rather a prominent position, and, on inquiry, I learned
t the patient used a considerable amout of force with the
sh. I have frequently and purposely in such cases cov-
d the teeth with a foreign substance, such as pumice
vder, having forced it well between the teeth, both those
which Erosion was still progressing, and those in which
contour of the teeth had been restored. Having done
s, I have allowed the patient just one mouthful only of
ter to rinse away the material. I have then examined
mouth, and have invariably found it thoroughly clean,
almost every particle, in some cases every atom of pow-
having been removed. I have taken numerous oppor-
ities of testing this, and the result has always been the
ne, the patient having made considerable use of the mus-
s of the mouth. In polishing fillings for patients not
ject to Erosion I have often had the greatest difficulty to
nove the polishing material by mere rinsing; they appar-
ly have no idea of moving the muscles of the mouth, but
t let the water roll round and out again. How far this
y be the result of diffierent temperaments I cannot say,
think that may possibly have some governing influence.

To recapitulate, it seems to me that we may consider Erosion in its first stage to be nothing more or less than the begining of caries; in fact, a dissolving of the tooth-substance which, however, never gets beyond the initial stage, as the materials are removed almost as constantly and continually as they are dissolved. Let this intermittent but frequent removal of the acid solutions cease, and I think we shall find caries will soon appear. We often see teeth attacked by Erosion, and adjoining the denudation we also perceive caries. Though there is a mared contrast between the two, yet the one often merges imperceptibly into the other.

We now come to the treatment of this mysterious affection. This must, until we know the cause, be, to a certain extent, empirical. It shoula be directed to restoring the tooth to its former contour, thus obliterating the friction channel. Mr. Coleman says he has found the constant application of ammonia, or one of its compounds, if persevered in, to arrest the disease. He use sal-volatile, applied three or four times a day, arguing that the alkilinity of the ammonia may neutralise the acid conditions of the contents of the dentinal tubuli; thus removing the predisposing cause. Other writers recommend the use of silver, but this gives a black unsightly appearance, though, I believe, it is effectual in the majority of cases. Chloride of zinc is also suggested.

Many cases seem to be particularly suitable for gold, providing it is thoroughly well done and polished, care being taken that not the slightest edge is left. But in proportion as the saving power of a gold filling seems to justify its use we often find its unslightly appearance would considerably nullify its advantages. Hence we must frequently have recourse to some other material. The various amalgrams and white cements all give way in these positions, but we have one other substance to fall back upon, and that is gutta-percha. I have known cavities carefully pre-

pared and filled with this to last a long time and give satisfaction to both patient and operator.

In conclusion, while thanking you for the attention you have given me, I cannot but be aware of the many imperfections which exist in the paper; however, I trust that what I have said may have been sufficiently interesting to prove a subject for discussion.—*London Dental Record.*

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## ARTICLE IV.

### *Porcelain Crowns.*

BY DR. W. H. SHULZE.

Replacing a lost tooth crown upon the remaining root has been practiced for more than a century, and yet until within a few years the practice was limited to a few methods, and these were used sparingly. In 1782 Robert Woofendale, said, "that the crown of a human tooth can be fixed to a sound root by the assistance of a screw of gold or silver." In 1814 Benjamin James said, "that some dentists fasten the new crown upon the root by driving the wire which is attached to the crown, into the canal of the root, with cotton wrapped around it to make it tight; while others place a piece of wood in the root and attach the crown to this substance." The mode preferred by Mr. James was, "simply screwing part of a gold or wood pivot into the crown and driving the other part (previously squared on its sides) into the wood socket, already perforated for its reception, and placed in the root." These were the principal methods, but owing to the difficulty and expense of obtaining sound human tooth crowns, and the unreliability of animal teeth and ivory, the practice was exceedingly limited. With the introduction of porcelain teeth the process of pivoting became more popular, and various methods were used for supplying the lost tooth crowns, until the porcelain pivot tooth, with a hole in its base to receive a wooden peg came into use. Then the principal method for many years was to attach this tooth

to a pivot made of hickory wood and fitted into the enlarged root canal. But after a time the many objections to the use of wooden pivots became apparent and teeth were more frequently replaced on small gold or silver plates, secured to some of the remaining teeth, by clasps; and as cheaper bases came into use the roots were almost always extracted, and the loss supplied by the insertion of artificial plates. However, along with cheap bases came cohesive gold, and the treatment and cure of diseased roots, so that those who were suffering with abscessed teeth and disfigured with decayed crowns, could have the one restored to health and comfort, and the other to its original form, with gold. Thus for many years it was either extract the tooth or build it out with gold; indeed most of us can recall the time that we thought a tooth that could not be filled with gold had better be extracted. Of course the preservation of the natural teeth is of paramount consideration and I believe that we should bring into use every appliance, method and material which will accomplish this result. We have combated heroically against the ravages of decay among the beautiful but degenerated teeth of the past and present generation, and done much towards saving them, but how often we have been disappointed at seeing our best efforts fail; not from lack of care, thoroughness or ability, but because we had poor tooth structures to build upon and irresistible conditions of the mouth prevailed against us. With increased intelligence as to what is necessary to make good, solid tooth structure, both in regard to diet and care, we can hope that better teeth may bless the jaws of the coming men and women.

As in time the wooden peg was found defective, so we have found many defects and failures in restoring crowns with gold, and the revival of restoring the lost crown with artificial substitutes by pivoting, is gradually gaining favor again. In bringing this subject before you for consideration I should like to have had the time to have informed myself thoroughly of every method that has been brought to the

notice of the profession in the last ten years, and presented them for our information and discussion, but I can only refer to a few of the many methods without any arrangement as to the priority, and add such suggestions as may be practical and beneficial.

Dr. Beers of California is accredited with the invention of gold crowns, having received a patent in 1873. The gold crowns were intended to take the place, to a great extent, of building out with gold, and in very many cases, answered a better purpose. The Richmond crown (as the gold crowns are termed) can often be used to superior advantage, and will prove serviceable when an attempt to build up with gold would prove futile. These crowns can be adapted also when the pulp is alive, the attachment being more particularly dependent upon the perfect fit around the cervical margin than a pivot in the root. But gold, from its conspicuousness in most mouths, must give way to the porcelain crown, which can be made equally useful and appear natural. During one of the periodial revivals of the old subject of the replantation of teeth, a novel plan was proposed (but whether practiced I do not know) of attaching the crown to the root. It was to extract the tooth and cut the crown off square. The porcelain tooth had a gold screw screwed into it, and was made square at the cervical base. The root canal was reamed out and the gold screw screwed into it, and then the whole replanted into the socket.

The plan of filling the root canal thoroughly with gold and attaching the crown with a gold screw, passed through a hole made for the purpose in the base of the gold, soldered to a plate tooth, was the forerunner of the Foster porcelain crown. This method is, I think, one of the best in use, but it requires much time and skill, and must necessarily be limited to the few, owing to the expense. Besides, it is adapted more particularly for incisor teeth, and cannot be used so easily for bicuspids and molars as other methods. In some cases I take the following plan, which is more

applicable where good access can be had at the lingual portion of the tooth. After cutting off the crowns, take a plate tooth and fit it to the root. Fit a heavy gold plate to cover the base of the root, and solder this on the gold backing. The root canal must be enlarged with a fissure bur, having the part nearest the apex of the root slightly the largest. With a thin piece of gold make a tube that will exactly fit the hole in the root, cut it off the proper length and solder to the gold plate, which must have a hole drilled in it to correspond with the hole in the root. Now, after-sawing down the tube about half way, press it into the root canal and pack gold foil into it. The spreading of the tube against the walls of the enlarged root canal, holds the crown firmly in place. This method also involves time and skill and consequently expense, and like a great many others can be adopted only when the patient is able to compensate the dentist, so that some plan, which is less expensive, and equally practical and useful, is of course the most desirable. I think the Bonwill crown system meets this demand. For the last five years I have been gradually abandoning the laborious process of building out teeth with gold, particularly in dead incisor teeth with discolored crowns, and have found the adoption of porcelain crowns much preferable, both as to utility and appearance.

It will not be necessary for me to enter into any detailed statement or description of the best plan for replacing lost tooth crowns, but I would urge those of you who have not given this subject much consideration to turn your attention to it, for you will find that any method, almost, is easier and more satisfactory for you, and your patients who have undergone the tedious and often doubtful operation of restoration by filling, will appreciate the difference. You can often make roots, that would otherwise be extracted, useful and obviate the necessity of wearing an artificial plate.

The past year I have used the Bonwill crowns in most all cases, for I find this method simple and practical. In

a number of cases I have prepared the root and attached the crown at one sitting, with less labor and fatigue to myself and patient than would be required in filling an ordinary cavity with gold in a position difficult of access. It is preferable, however, to secure the pin in the root and let the amalgam become hardened before attaching the crown. I will not prolong this article by describing the method which you are more or less familar with, but refer you to Dr. Bonwill's articles in the "*Cosmos.*" However, I will cite a couple of cases: One that I had last March, and more than a year ago, which will illustrate the appreciation of the patient. A gentleman who resided in New York city for many years (living in our prohibition city now) called on me to attend to his teeth. He had many fine gold fillings in his teeth, and as he expressed it, "You see doctor I have been through the mill." The incisors were filled on the labial surface, and on the approximal sides. The point of the left central had broken off, carrying with it the approximal and labial fillings, and left the half of the lingual wall standing with the root filling. He wanted the tooth built down. I proposed attaching a crown, and after a little persuasion, for he had heard only of wooden pivot teeth, he consented. I had difficulty in getting a match for the color of his teeth, but I finally succeeded, after having three different teeth made at Philadelphia. I had a hole made in the labial surface, which I filled with gold to correspond with the right central, and when the crown was attached it required a mouth mirror to discover which was the artificial substitute. He was pleased with the result, expressed his gratification at being relieved from the long filling operation, has several times assured me of the stability and comfort of "his new tooth," as well as his surprise that the "thing could be done." The other case was for a lady, for whom, ten years ago, Dr. Callahan spent six hours in building up a gold crown upon frail walls on a lower molar. The length of time the filling stood is a compliment to the gentleman's ability, for it was one of

her main grinders. She came into my office in distress with the filling in her pocket-book. I told her I was glad the tooth had broken away, for she was always worrying about losing that tooth, but she wanted it built up again. I proposed a much easier method, and at once cut off the remaining portion of the crown, and took an impression of the space, and adjoining and antagonizing teeth. As the space was quite large, I sent the plaster cast to Philadelphia to have a special crown made. When received I set the two pins in the roots and attached the crown in an hour. It is firm and with the exception of the small amalgam fillings in the crown, it would be taken for a perfect natural tooth upon examination. The lady has expressed her thanks often, and told me that she would rather pay twice as much for an artificial crown and be spared the tedious operation of filling.—*Proceedings of Kansas State Dental Association.*

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## ARTICLE. V.

### *Combination Tin and Gold Fillings.*

BY A. H. THOMPSON, D. D. S., TOPEKA, KANSAS.

A very interesting discussion occurred in the meeting of the Odontological Society of Pennsylvania, November 5th, 1881, (See "*Dental Office and Laboratory,*" January, 1882,) upon the advantages to be derived from combining gold and other filling metals, such as tin or amalgam, in proximate fillings, presenting in the buccal teeth.

Dr. Darby had "long noticed that when gold or amalgam came in contact in the same tooth, that there is always a greater discoloration of the amalgam than when the two do not touch." He had "also observed that the edges of the amalgam which came in contact with the tooth, are much warped, and there is less appearance of shrinkage." He was "firmly of the opinion that it injured practice to

gold and amalgam meet in the same tooth." Just what nges are produced in this union he could not state, but e is undoubtedly some change taking place, which is eficial to the filling."

r. S. G. Perry cuts a narrow channel around the margins is large amalgam fillings, after hardening, and fills it gold, securing a close joint.

r. Corning "believed there was no more immunity decay when amalgam was used at the cervical edge when gold was used. There was much still to be ned about amalgam."

r. Register had "noticed and carefully noted, that teeth certain quality, re-decaying at the cervical walls, when d with amalgam at this point, when in communication gold, remain perfect for many years. I had this forced my notice through several failures with gold alone, at last resorted to amalgam, at this point temporarily idge over a stated time for an unanticipated European I now, generally, when finding an otherwise perfect filling breaking down at the cervical portion, cut away immediate decay and fill with amalgam, in direct con. with the gold. My impression is, this combination of ls forms a galvanic action which decomposes irritating , which would otherwise attack the lime salts. A ary battery of acids, attached to a secondary one of ls, will deplete itself in charging the latter, and then in part, flow back until drawn off and used by inter. ion; and this flow continues back and forth each time, ming less and less, until the current (for it is a current, not undefined), ceases, and there is an equilibrium lished—and this, to my mind, is what we have in the th by the union of the metals."

r. Jack said he "confessed to having learned something ference to repairing gold fillings in difficult situations amalgam, his previous inclination having been averse mbining two such apparently opposite thing."

r. Jas. Truman said that "experience is altogether on ide of patched cases with amalgam, and it should be

more resorted to than has been heretofore the case. The use of tin and gold, as recommended by Dr. Abbott, of Berlin, is based on this idea. The failing of cervical margins has led to a change of practice with many. The superiority of tin and gold led Dr. Jenkins, of Dresden, to use it in all approximate surfaces of bicuspid teeth at the cervical margins. The galvanic action confined itself to the metals in combination, resulting in a dark, hard body, resembling amalgam both as to color and destiny but effectually protecting the margin from decay."

There is so much of interest bearing upon our subject, and its elucidation in the above discussion, that it is copied entire, although it may seem a rather lengthy text. But it is only to the advantages of employing tin and gold in combination in the proximate cavities of bicuspids and molars that we wish to consider at present. The chemistry of the subject and the scientific explanation of the theory of the influence of tin as an adjunct of gold in protecting cervical margins, is sufficiently detailed in the discussion quoted. To these we must add the advantageous properties of tin—the peculiar softness and malleability—which makes it the principal one of the soft working filling metals. These qualities allow of its more perfect adaption to the soft, often frail, and always difficult to reach, cervical margins of approximate cavities, than any of the preparations of gold. The peculiar qualities are well known to the older generation of operators in this country, and it was extensively employed with excellent success. The mechanical advantages, as well as the chemical qualities, which had an effect in preventing caries, were well known to the fathers. But its two disadvantages of discoloration and softness which allowed of too much wear in exposed positions, led to its general disuse. To this may be added the inability of the younger generation to work metals on the "soft," non-cohensive principle, after the introduction of cohesive gold, which accelerated the abandonment of tin.

But in the present mode of employing tin, the two jections are obviated; the discoloration is rendered unob-ctionable by using it only in concealed positions, and the sposition to wear is prevented by covering it on exposed rfaces with gold. Discoloration renders tin objectionable r the incisors and canine teeth, except, perhaps, in very ep cervical or lingual cavities, but its use in these teeth generally unsafe, on account of the possibility of staining e tooth substance, even to some distance from the tin. s use is confined almost exclusively to the buccal teeth, t as these are most vulnerable upon the proximate sur-ces, and fillings, in these positions most liable to failure, e discrimination is appropriate.

The tin is used by packing carefully against the groove out the cervical margins, being careful to bind it into the vity as it is introduced. The extent to which it may be ought down is governed by the weakness of the cavity argins, the remoteness of the tooth from the front, and the ssibility of stains. It is protected from the wear of masti-tion by covering well at the margin and properly sloping e filling with gold. This is necessary to insure durability well as to better secure the tin. If the marginal walls e weak, the tin can be brought up to them with greater se, safety, and possibility of adaption, leaving only secure achments on each side for the gold. If near the front, in the bicuspids, only gold can be used against the buccal ll, for the tin will be sure to stain the enamel, and its e is also contra-indicated in places where there is a possi-ity, even remote, of the stain reaching a visible portion the tooth. The disposition of the oxide to penetrate the ntine and enamel must ever be borne in mind; for hough this will have a certain preventive influence, and event the return of caries, even this advantage can not gained by the sacrifice of appearance and beauty.

Cohesive gold filling, more especially the extensive, diffi-lt, exhaustive, costly kinds, upon the proximate surfaces bicuspids and molars, have a notorious, provoking dispo-

sition to fail at the cervical margins. The experience of most members of the profession is that they are the most unsatisfactory of all operations in filling, on account of their most certain failure at this most vulnerable point. We are all most reluctant to examine these margins when diagonizing a dentine, on account of the almost certainty of finding decay, and the difficulty and uncertainty of its repair.

This failure is not due entirely to defective work, for the fillings of the best operators in gold are not entirely exempt from it, as we can all testify from the patients who have fallen into our hands. It is not usually due to defective preparation of the cavity of decay, to improper manipulation of the gold; but it is due (1st) to the softness of the cervical margins which will not allow of cohesive gold being brought up close and water-tight, (2d) to the difficult access to this portion of the cavity, and the necessarily imperfect contact, and (3d) to the chemical and galvanic properties of the gold which cause the development and concentration of acids upon the dentos at that point. Any one of these reasons we consider sufficient to warrant its abandonment for tin, which, undoubtedly, is not open to these objections but is materially and pratically preferable in view of objections made against gold.

The writer's experience and observation of the remarkable and altogether disproportionately large percentage of failures of the cervical borders of gold fillings on the proximate surfaces of the buccal teeth, led him, some years ago, to determine upon a radical change of his methods of treating these cavities, in the medium and worst classes of teeth at least. Study and experiment in the subject led to the adoption of the tin and gold combination filling, with good results. Several years employment of this method, with almost complete success, has established the conviction that it is by far the best and most satisfactory filling for these cavities. In the few cases where it has failed, the cause has been directly traceable to defective preparation of

he cavity, or manipulation of the metals. Where this can be detected, of course the correction is plain and easy, and he practical results are thus under control. But in the case of gold the controling influences are different and beyond our power; the opposing properties of the material, he difficulties of manipulation, are uncontrollable factors f the operation; and where success or failure is a matter f accident, with the stabilities in favor of the latter, the andid man must seek something more promising and posiive. This, we claim, the tin and gold combination gives s.

The probable bearing which the "New Departure" heories have upon this matter, we have not taken the time consider; but it is probable that the various electrical roperties of the two metals in contact has much to do with he success of the method. The compatibilities are cerainly more nearly adjusted. But we cannot go into this ranch of our subject, and prefer briefly to place the method efore you as a safe and practical thing.—*Proceedings of Kansas State Dental Association.*

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## ARTICLE VI.

### *ffects of Irritation on the Motor Region of the Brain.*

The present generation of physicians have been taught believe that owing to a decussation of fibers at the base the brain, each hemisphere holds its relation to the oppote side of the body and not on its own side. But we are ow required to modify our views on this subject, if not throw them aside. According to the London *Lancet*, r. Brown-Sequard repudiates the old theory. The numerus researches which he has undertaken during the last ur years seem to him to involve conclusions exactly conrary to the opinions which are universally received, For xample, against the assertion that the irritation of the otor region of the brain uniformly produces movements

in the limbs on the opposite side, he opposes certain experiments of his own. These show that irritation of one side of the pons Varolii or of the medulla, even of the anterior pyramid, causes eight or nine times out of ten movements of the limbs on the same side, and the same effect is observed when, after a transverse division of one-half of the medulla, the superior part of the pons is stimulated, mechanically or by electricity, in the part considered as motor. Irritation of the cerebral peduncle in the part considered as motor often causes movements of the limbs on the same side. This result occurs five or six times in ten when the stimulation is applied to the upper part. If the fibers are galvanized which pass from the corona radiata or corpus striatum to the peduncle, movements are often observed on the corresponding side of the body. If these parts are divided transversely on the right side or on the left, the mechanical excitation thus produced rarely causes movement, but when it does the effect is usually manifested on the same side as the irritation. Even stimulation of the motor zone of the cortez, as Couty has shown, sometimes causes movements on the corresponding side. Moreover, Dr. Brown-Sequard has repeatedly showd that if this zone is galvanized, after the lateral half of the medulla or of the pons Varolii is divided, the movements in the opposite limbs, instead of being prevented by this section, occur with still greater force than before the division of those conductors which have been believed to be alone capable of transmitting the stimulation of this zone to the limbs.

According to received doctrines, if one lateral half of the cervical cord is divided at the level of the second pair of nerves, and different parts of the brain are then stimulated, mechanically or electrically, on the same or on the opposite side to the spinal lesion, no movement should occur, or only a very slight movement in the members on the same side as the lesion. But Dr. Brown-Sequard finds that, under these circumstances, stimulation of the brain

ises energetic movements of the limbs, such as "bipedal" ovement, diagonal or lateral, to the right or left, or a vement of three, or even of four limbs. He concludes m this that one-half of the cord will suffice to transmit the limbs, on both sides of the body, the excitation ised by stimulation of the opposite half of the brain.

According to received doctrines the transverse section of e two lateral halves of the base of the brain; the one tion at a distance of one centimetre above or below the ier, ought to destroy all or almost all communication ween the spinal cord and the portions of the brain above higher section, so that mechanical or chemical excitan of the cortex should cause no effect on the limbs. But . Brown-Sequard asserts that under these circumstances only does stimulation of the motor centres act energically upon the limbs, but the same effect is produced by nulation of the parts which are not considered to be tor, such as the optico-striate bodies. In this case, also, effect is usually most marked on the same side as that nulated. An analysis which Dr. Brown-Sequard has de of 500 cases of unilateral convulsions in consequence varied lesions of the brain, show that the same result is e of man as of animals. Irritation of the base of the in and the adjacent motor regions causes convulsions re frequently on the side irritated than on the other. e superficial parts of the brain, it is true, produce chiefly ssed convulsions, but irritation in all parts *may* cause vulsion on the same side.

The conclusions drawn by Dr. Brown-Sequard are that of the chief foundations for the theory of psychotor centers, and of the crossed functional relation ween the hemispheres and the limbs, must be considered have lost its value; and, secondly, that the excito-motoe of the cerebral surface, and indeed all the excitable ts of the brain, are capable of putting in action the bs of the same side, as well as those of the opposite side, l that they may produce these effects after the transverse

division of one-half of the pons Varolii, of the medulla, or of the cervical cord, and even after two sections of the base, one of the right half and the other of the left, provided a certain interval exists between the two.—*Pacific Med. and Surg. Journal.*

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## ARTICLE VII.

### *Color Relation of Metals.*

In a paper on the color relations of copper, nickel, cobalt, iron, maganese, and chromium, lately read before the Chemical Society, Mr. T. Bayley records some remarkable relations between solutions of these metals. It appears that iron, cobalt, and copper form a natural color group, for if solutions of their sulphates are mixed together in the proportions of 20 parts of copper, 7 of iron, and 6 of cobalt, the resulting liquid is free from color, but is grey and partially opaque. It follows from this that a mixture of any two of these elements is complimentary to the third, if the above proportions are maintained. Thus a solution of cobalt (pink) is complementary to a mixture of iron and copper (bluish-green); a solution of iron (yellow) to a mixture of copper and cobalt (violet); and a solution of copper (blue) to a mixture of cobalt and iron (red). But, as Mr. Bayley shows, a solution of copper is exactly complementary to the red reflection from copper, and a polished plate of this metal viewed through a solution of copper salt of a certain thickness, is silver white. As a further consequence it follows that a mixture of iron (7 parts) and cobalt (6 parts) is identical in color with a plate of copper. The resemblance is so striking, that a silver or platinum vessel covered to the proper depth with such a solution, is indistinguishable from copper.

There is a curious fact regarding nickel, also worthy of attention. This metal forms solutions, which can be

xactly stimulated by a mixture of iron and copper soln-ions; but this mixture contains more iron than that which complementary to colbat. Nickel solutions are almost omplementary to colbat solutions, but they tranemit an xcess of yellow light. Now the atomic weight of nickel very nearly the mean of the atomic weight of iron and opper, but it is a little lower, that is, nearer to the iron. 'here is thus a perfect analogy between the atomic weights nd the color properties in this case. This analogy is even nore general, for Mr. Bayley states that in the case of iron, obalt, and copper, the mean wave length of the light ab-orbed is proportional to the atomic weight. The specific hromatic power of the metals varies, being least for cop-er. The specific chromatic power increases with the ffinity of the metal for oxygen. Chromium forms three inds of salts: pink salts, identical in color with the co-alt salts: blue salts, identical in color with copper salts; nd green salts, complimentary to the red salts.

Maganese, in like manner, forms more than one kind of alt. The red salts of cobalt salts and with the red chro-nium salts. The salts of cromium and manganese, accord-ng to the author, are with difficulty attainable in a state f chromatic purity. He thinks that these properties of he metals lead up to some very interesting considerations. -*Chemical Review.*

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*The Dental Department of the University of Maryland.*—The egular or winter session of this institution began on the second ay of October, 1882, under the most favorable auspices. Forty ental students were present, and had matriculated, at the intro-uctory lecture delivered by Professer Gorgas, on the opening ay, an unprecedented number for the begining of the first egular session of a dental school, and without a parallel in the istory of any dental institution.

Students are yet entering, and the above number will be argely increased during the present month. The following States and Countries were represented by the students who were

present at the opening of the session : Mass. Vt., Maine., N. Y. N. J., Penna., Md., Va., W. Va., Mich., Wis., N. C., S. C., Ga La., Ky., Mo., Ind,, Minn., Germany and Cuba.

Friends of this new Dental Department will be gratified to learn of this auspicious commencement of the first regular session.

The Infirmary practice has rapidly increased and is now equal to any that has ever existed in Baltimore: and there is every reason for predicting that it will very soon, on account of the numerous sources at command, exceed all requirements.

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# EDITORIAL, ETC.

*Pulp Treatment.*—Dr. Bödecker, in the New York Odontological Society meeting in April last, states that it is practicable to destroy the periphral portion of a tooth pulp, with arsenious acid, and that action of this agent, if continued any twenty-four hours, is periphral only. If continued longer it devitalizes the entire pulp. He states that it is possible in this way destroy a pulp on the surface only, and that amputation of the divitalized portion may then be perfomed, with a saving of the remaining portion of the organ. In the amputation he goes below the "line of demarkation," and into the healty tissue beyond. The language is "a great deal below the line of demarkation." Amputation of a part of the pulp may be performed thus with a sharp bur, or excised in any convenient manner. Dr. B. holds that the remaining portion of the pulp will perform its functions satisfactorily. He quotes from Witzel, whom he represents as saying that he has so far performed six hundred amputations of the pulp without a single failure.

Certainly if one can get parts of pulps to live it will be a great blessing, especially in molar teeth., where the filling of the roots is impracticable. The doctrine is not new, but has been so disputed that we remember hearing celebrated men, among others, college professors, saying that they had never seen a case of successful nerve capping. This, of course is not true of all observers, but that many failures occur is patent.

this has been due to leaving diseased portions of the pulp position, and if amputation with the aid of arsenic is prac- able, and if the pulp after such amputation and deprivation a part of its substance will still perform its functions, we y take courage.

J. B. Hodgkin.

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*Improvements in Vulcanite.*—Since Vulcanite, whether right or ong, is used so very largely, any improvements in its manip- ıtion tending to make it more acceptable to the profession l useful and tasteful to the wearer, are in order. There were ibited at the last meeting of the Southern Dental Associa- n in Baltimore, a number of pieces of vulcanite, beautifully ted with gold on their palative surfaces, in a manner cal- ated to make such work much more acceptable to the wearer, dering the cleansing of this part of the denture an easy task. know how difficult is the removal of the mucous collection m the palatal surface of these plates, and it is doubtless this ich is the cause of the sore mouths one often sees under such tes. In the case of these plates, as only pure gold is in contact h the mucous membrane, the poisoning theory from the rcury sulphurut is removed. So far the method seems only uccess in the hands of an expert. Doubtless it could be plified so as to render it capable of management by the rage dentist. As dentists will make, and patients will ır vermillion colored plates, this invention, which we be- ve is patented, may put them at ease on this question. We ll watch its development with interest.

J. B. Hodgkin.

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# MONTHLY SUMMARY.

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*American Dyspepsia.*—In the Boston *Medical and Surgical rnal,* Dr. James H. Robbins takes the ground that the preva- ce of dyspepsia among us is due less to improper food, badly

prepared, to taste in eating, or to excessive eating, than to the fact that we nearly all are the possessors, either by inheritance or acquirement, of imperfect nervous organizations that are consequently unable to lend their aid to digestion as they should; for this reason but few of us are able to digest enough food for our bodily repair; hence we experience the sensation of having over-eaten, when in reality we have not had enough. The author says:—

"Such causes operate with special power upon us of the present generation of the Anglo Saxon race, whose ancestor came to this country several generation ago, for the reason that from these ancestors we inherit nervous systems of impaired vigor. Our parents and grandparents were so strenuously engaged in an arduous, ambitious, and competitive endeavor, amid the rapidly changing condition of life in a new country, to secure competency and respectable social position, that they expended to a great degree, their own vital powers, and have accordingly transmitted to their children delicate and neurotic constitutions. If it is granted that we inherit a diminished vitality, it is easy to see how ingeniously the pressure, the wear and tear, the strain, the excitement, the hurry and worry incident to this breathless, bustling life of ours, affect the nervous system. It is also evident that impairment of digestion and mal-nutrition must be the certain result of such a condition of things."

This deterioration of the nervous system is fostered and increased by our faulty methods of raising children and our own erroneous style of living when we reach maturity. The evident remedy is to be found in an elevation of the tone of the nervous system. Whether this theory be true or not, it is a very charming one, and would certainly seem to account for much of the dyspepsia that renders so many persons miserable.—*Medical and Surgical Reporter.*

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*Rest in Treatment of Heart Disease.*—By this we mean not positive, but comparative rest; neither do we refer to acute inflammatory affections of the heart, wherein, from the very gravity of the disease, confinement to bed and consequent rest become necessarily assured. We are thinking of those cases of

; exhaustion, so to speak, of individual whose general health onicity is much run down, from overwork or abuse, and in n the heart shares in this general vitiation. Possibly the n is not in itself diseased; its organic integrity may be per- but its muscular walls may be flabby and weak, ready to to, or, more properly, unable to resist any great strain. If n in this condition, the man resorts to any violent muscular cise, or subject himself to the influence of violent physical ions, this weak heart may become mechanically distended s efforts to perform the extra labor demanded of it. Or if be that dilatation has already taken place to some extent; does it become important to allow the organ time for the lopment of the beneficent hypertrophy that will do so much reserve its integrity. By rest we mean to advise your ents who are threatened with or already have dilatation of heart to do everything slowly, to perform every act of life berately, and to avoid, as far as possible, all occasions calcu- l to excite the passions emotions. We must ever remember a delicate machine the heart is and how easily it can me deranged, and realizing this, must consider how much care this organ requires when it is already diseased. We , under such circumstances, walk slowly think slowly, eat ly, in a word, do everything slowly. It is not well, and we ot recommend the carrying of this advice to the verge of ess; but what we do mean is, that while it is well for all er sound or diseased) to avoid hurry, it is ten times more rtaut, aye, absolutely imperative, for the man with a weak seased heart.—*Medical and Surgical Reporter.*

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*od Adulteration.*—Dr. Charles Smart, U. S. A., in the *Na- l Board of Health Bulletin*, January 1st, 1881, submits a t of interest on this subject, prepared by instructions from National Board of Health. The first adulterated article of alluded to is tea. Of 109 teas examined, 90 were obtained sources which should have furnished a pure article, 19 obtained from questionable sources. The results of thorough inations permits the committee to report that they think dulterationis not carried on to any very great extent. In

England, the chief adulteration of coffee is chicory. Dr. Hassall testified before the Food Commission, in 1855, that of 34 samples which he had examined, 31 contained chicory. Normandy found as much as 75 per cent. of chicory. Roasted wheat, bean rhy and potato flours, mangel-wurzel and a substance resembling acorns, roasted corn, and ground cocoa-ribs, while as adulterations of the chicory were found deal and mahogany sawdust carrots, Venetian red, and burnt sugar. The reporter pertinently remarks that while in this country we have the credit of making wooden nutmegs, we have never been accused of manufacturing coffee beans from compressed chicory. In England, sand in sugar is a familiar phrase. Most of the sugar there examined was dark in color, mixed with much vegetable extractive, and swarming with sugar mite. The sugar of the present day is purer. The report concludes that manufacturers of flour do not to any great extent doctor the flour, but that bakers do. Corn meal, bicarbonate of soda, cream of tartar, baking powders, black pepper, pickles, confectionery, and other common household agents, were noticed, and a detail of the method of examining them. It is a useful report.—*Buffalo Medical and Surgical Journal.*

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*Tobacco Smoking—An Experiment*—A writer in the *British Medical Journal* says: "If the fumes from a cigar, pipe or cigarette be instantly ejected from the mouth and throat before descending into the chest, and be made to pass through a cambric handkerchief drawn tightly across the open lips, a permanent deep yellow stain, corresponding in size and shape to the opening between the lips, and having numerous spots of a darker hue pervading it, will be left on the handkerchief; but that the prolonged puff from the chest, after inhalation from a cigarette, fails under similar circumstances to produce any but a scarcely perceptible and speedily evanescent mark. Query: What in the latter case becomes of the substance which stains?

"I am not aware of any instances on record in which the lungs of the cigarette-smokers have been specially examined; but it would be interesting to know whether by perseverance one could color one's bronchial tubes as one does a meerschaum; and, if so, whether the process would be attended with risk."—*Pacific Med. and Surg. Journal.*

*1 Marvel of Surgery.*—Dr. Roswell Park, of chicago reports a rvelous case that he has recently seen in Prague. The great geon, Gussenbauer, more than a year ago removed the larynx l epiglottis of a patient suffering from cancer. Six weeks rward he began to wear part of the artificial larynx, and er accustoming himself to this, he gradually learned how to roduce and use the reed which takes the place of the vocal ds. The patient is a riding teacher, talking a great deal, l does not suffer the slightest inconvenience or pain. His ce is monotonous, but his enunciation excellent, his speech fectly intelligible, and he eats and drinks with perfect facil-. Three intra-laryngeal operations had been previously made ore Gussenbauer attempted his feat.—*Medical and Surgical porter.*

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*Nitrous Oxide.*—Further experience has not changed the rela-e position or very much enlarged the sphere of action of rous oxide. That is the safest of all anæsthetics has been ablished beyond a question. In one institution where such ministration is subject of record, this gas has been given over 0,000 times, and not only without a death but without caus-; in a single instance symptoms sufficiently serious to neces-a'e transporting the patient home in a carriage. In the city Philadelphia alone, it has been given over 133,000 times thout a death, and without any injuries results. Death can-t be justly attributed to it in more than four cases since its rcduction.—*F. C. Reeve, in Holmes' Surgery, American lition.*

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*Oxalate of Lime Calculus.*—Dr. E. L. Keyers presented the lculus material removed by rapid lithotrity from the bladder a boy, nineteen years of age, who was referred to him by Dr. ondy, of Jersey City. It weighed four hundred and forty-ree grains, and he thought that the entire stone weighed one nce It was pure *oxalate of lime.* The operation occupied irty two minutes. The largest grasp was one inch and a urth. Although he used a two-inch wheel—unusually large—e stone was crushed with a good deal of difficulty. The debris

was removed without trouble through a No. 16 tube. It was the largest oxalate of lime calculus he had ever encountered. —*Med. Record.*

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*Backache: Its Causes.*—Dr George Johnson, in (*Brit. Med. Journal,*) says that in the great majority of cases the pain of backache has its seat in the muscles, and is a simple result of strain or over fatigue of the lumbar and erectores spinal muscles and tendons. A remarkable feature of the pain resulting from excessive muscular exercise is that, while it may continue more or less during rest in bed, it is usually much increased by the first movements after rest, but gradually diminishes after moderate exercise. In muscular lumbago, standing is more fatiguing for the back and legs than walking, and leaning forward puts a greater strain on the muscles of the back than standing erect. Pain is often more severe on one side than on the other, owing to the common practice of throwing the weight more on one leg than on the other. A common cause of painful overstrain in the dorsal muscles is an excessive weight in the abdomen, whether from advanced pregnancy, dropsy, or excessive development of fat. Dr. Johnson, in speaking of these causes, incidentally gives the dietary advisable in obesity. He also calls attention to dyspeptic myalgia resulting from malnutrition of the muscle. "Growing pains," Dr. Johnson thinks, are due to excessive muscular exercise, and are to be cured by rest. Sudden pain is sometimes caused by cramp or rupture of some fibers of the muscle during contraction. Indigestible food sometimes causes cramps in muscles in certain individuals instead of cramps in the stomach. Cold, as is well known, is a freqnent cause of pains in other muscles besides those of the back. For lumbago Dr. Johnson recommends hot air or Turkish baths, followed by vigorous shampooing; also an embrocation composed of equal parts of linimentum belladonnæ and linimentum opii.

Other causes of backache are aneurism of the aorta, the symptoms of which Dr. Johnson gives at some length, with illustrative cases; cancerous glands in the abdomen; diseases of the kidneys; gastric ulcer; uterine diseases; diseases of the bones of the spine and of the spinal cord; and, finally, the backache of commencing fevers.

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## ARTICLE I.

### *Diagnosis and Treatment of Benign Tumors.*

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A tumor, as the word signifies, is any swelling. But n this broad definition practical wants have led to the y many divisions, subdivisions and classifications that wd our exhaustive works on surgery; indeed, this one ject not only claims more space than any other in them, whole works are published continually on tumors as a s, or even on any one kind of tumor. Certainly this is plexing. It is our aim, therefore, in the present article, place before the general practitioner such condensed rmation on the subject of benign tumors as may be ful in ordinary practice.

Jnder the term new growth, foreign growth, in its widest se, are comprehended all those foreign processes that e place in the human body; either by cell formation, or precipitates and concretions out of the liquids. The er possess no texture; these are mostly stones and gular concretions. On the other hand, we may readily ognize a regular structure and texture in the first named, ich, in chemical relation also, claim for them the desig-

nation of "organic;" moreover, they offer a long list of common characteristics, which in many respects are entirely independent of the tissue or part in which they appear.

These organic new growths fall, of themselves, into two groups, benign and malignant, principally the former claiming attention in this paper. In spite of the great variety of organic new growths, they all resemble each other in one respect, and that is, that they are composed of the same morphological elements that we find also in the healthy body, and develop themselves on the same plan of construction as normal tissue. In the arrangement and length of development of their elementary principles, the different new growths vary perceptibly as well from normal organs, as from each other. It is upon this and upon the different texture of the pseudoplasma that the distinction above named founds itself, of which more anon.

It is of great importance, theoretically as well as practically, that the morphological elements of new growths can be subject to the same changes as those of the normal organs of the body—namely, the so-called regressive metamorphosis: the fatty, colloid, amyloid degenerations, the mucous softening, the chalky (lime) and bony processes. The chemical composition of new growths shows no marked differences from that of normal tissue.

Albumen, fibrin, cheesy matter, fat, further, substances that give lime and cartilaginous lime on boiling, pigment, also the ordinary salts, cooking salt and phosphate of lime, and finally, water, in greater or less quantity, have been with certainty demonstrated, by chemical analysis, to exist in tumors. In tumors we often find widening and tearing of the blood vessels that run through them, therefore, also, bleeding, inflammation, ulceration and gangrenous disturbance are also found.

*Ætiology.*—The general ætiology of new growths is very dark. As local cause, only a certain irritation of the diseased part can be considered. As regards predisposition, it may be noticed that new growths are not unfrequently inherited; sometimes they are on the patient when born;

gain, they are at other times endemic or epidemic. Pre-disposing are also early youth and old age, overwork and insufficient food, also other disturbances of the general system, brought about by former diseases. But to return to our two groups—embracing all tumors known—benign and malignant.

From a practical standpoint those tumors are benign which rest upon purely local causes and interfere with certain functions only by pressure upon or pushing aside organs. They can entirely stop the action of an organ, and thus become harmful to the individual, even, perhaps, threatening life, but do not at all exercise any evil influence directly upon the general system. Finally, they remain circumscribed in the locality where they sprung up, and do not return after extirpation. In distinction from these we designate as malignant tumors, those that continually and steadily grow, and finally soften (break down); that successively appear in different places and different organs; that return upon the same or other places after extirpation (recidiration), finally, that develop a marked and general affection (cachexia), and most always bring death to the individual suffering from them.

To the first belong fatty tumors (lipoma), sebaceous tumors (steatoma), fibrous tumors (fibroma), the different skin tumors (cysts, lupiæ) and bone growths (exostoses); vascular tumors (aneurisms, varices, telangiectasis), also polypi, cartilaginous tumors (enchondroma), that first became distinguishable by microscopic research, and were earlier mostly classed under the so-called steatoma, but only on account of their consistency and outward appearance. The representative of malignant tumors, from Hippocrates down to the present day, is cancer (carcinoma), so that malignant and cancerous are still used as synonymous. The fungus medullaris can be only technically a distinct or separate form of cancer; its origin being a hardered mass (scirrhus). Sarcoma is also included, and the tubercle, that formerly belonged to inner medicine only in the category of malignant neoplasms.

*Diagnosis and Treatment of Fibroma.*—The diagnosis of fibroma is not without difficulty. Fibrous tumors can be confounded with other hard tumors, or even some soft ones; in many cases it is, for instance, difficult to say wit l certainty whether the tumor is more of a fibrous or sarcomatous nature. The diagnosis, by a due regard to the tough, stringy or knotty consistency of the tumor and its hardness, must be our main *point d' appui* in excluding other growths, such as enchandroma,, osteoma, cavernous tumors, cysts, cancers and sarcoma. Fibrous tumors, like other benign ones, do not possess the tendency of malignant tumors, to soften from the centre out or to soften in different places. As opposed to malignant tumors, fibroids never cause disturbances of the general system, and generally never other disturbances than those of purely mechanical origin and corresponding to the size and locality of the tumor. Swelling of the adjacent lympth glands is absent, except when it is occasioned by inflammation of the tumor. Emaciation and loss of strength are also absent, as a rule, but can develop when the tumor by its position, by ulceration or hemorrhage of its ulcerated surface, produces disturbance of the general system. The only treatment of fibroid tumors consists in operative removal. In general, thorough and complete extirpation with the knife is the best; nevertheless, if the seat and relations of the tumor admit it, other means of separation may be advantageous—écrasement linèario. Chloroform may be given. Prof. Nathan R. Smith used a little chloroform in the extirpation of a fibroid tumor of the breast, in a young colored girl. I had the pleasure and honor to assist him, at his request, in this operation. The patient, a young woman, was about 18 years of age and well nourished, otherwise perfectly healthy, menstruating regularly. The tumor was situated in the left breast, movable and hard. The Professor grasped the tumor at its base and made the incision along the upper surface with a scalpel, and in the long diamater, while I held the edge of

wound and took up the arteries. The operation lasted 'a very few minutes; no sutures were used, the edges :he wound being secured by adhesive plaster, and the ient making a good and rapid recovery. The tumor about the size of a turkey's egg. There was nothing uliar about the case, but it is a good, typical one, strating the ordinary facility with which fibroids may removed, and a guarantee thus given against return; it further gives some idea of Prof. Smith's views upon administration of chloroform during surgical operations. ien the girl asked to be thoroughly narcotized, he replied, do not want to put you into your last sleep." We e her, accordingly, a partial narcosis only. In the ory of a given case of fibroid we will generally find the wth of the tumor has been slow and without pain.

*)iagnosis and Treatment of Lipoma.*—Fatty tumors elop themselves almost entirely at an advanced age. acceptance of the diathesis lipomatosa theory is not ranted by practical observation. The etiology is dark. blow, push or knock may cause them. They grow vly and without pain to the patient, whose first inconience from them is felt when they attain a large size. the hand they fell like lumps of normal adipose tissue, can be pushed aside, and have always a certain tough stance. The diagnosis of this particular kind of tumor omparatively easy. Pharmaceutical treatment is almost less. Extirpation is the only radical cure, and this should done as early as possible. If the tumor has attained size of a nut or of a hen's egg, or is growing in such a nner as may be seen from day to day, then the operation ıld be performed at once, as it is very simple, and ain success always follows it at this period, while longer ıy invariably brings some dangers. But if the base of tumor has already passed the size of a hand, then it is er, as a rule, not to operate; because such a lipoma, to itself has never had death as a consequence, while an ration that would leave a wound surface of such extent,

even undertaken in the most favorable conditions, may endanger life. If the tumor threatens to break through the skin, the operation should be performed, under almost all circumstances; also when the seat of the tumor endangers life. The extirpation of fatty tumors requires great care. At times it is impossible to remove all parts of a lipoma. But even if we remove the most of it we have accomplished much, and it is pretty well established that pieces left behind neither become the germs of larger tumors nor interfere in any way with cicatrization.* In the case cited by Burow,† who extirpated an enormous growth of this class, weighing 27½ pounds, it was impossible to remove the whole tumor. "The healing of the wound took place with incredible rapidity, although large pieces of the still remaining lipoma died in the wound and sloughed off." Considerable hemorrhage may occur, but this is exceptional. If the patient is knife-shy, the écraisement linéarie is in order, but the galvano-caustic wire is much better, and prevents effectually hemorrhage from smaller vessels. Sometimes it is possible, after making an incision in the skin, to isolate and tear out a lipoma with the fingers, by pulling the tumor toward the operator with one hand and pushing back the skin from around it with the other.

*Diagnosis and Treatment of Enchondroma.*—The cartilaginous tumor forms a round mass with smooth or slightly nodulated surface, that can attain different sizes; sometimes very large size. The commencement may be only as large as a pea, and can take place wherever cartilage exists in the body (Virchow) Not infrequently these tumori, later on, become ossified. They generally cause little trouble beyond pressure, and can exist from fifteen to twenty years as harmless tumors. The chemical examination of enchondroma has determined that they give chondrin as their main principle. As regards their

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*Lebert. *Abhandlung der practischen chirurgie*, p. 119.

†Burrow. *Deutsche Klinik*, No 24.

ology they often date from earliest childhood, and I.
üller notes especially that the mechanical influences of
e and the process of formation of bone during childhood
e the first causes of abnormal cartilaginous growths. As
r as my own personal experience is concerned. I have
nerally seen them on the fingers and toes. One case of
eat interest merits a line in this connection. It was that
a young man of about 25 years of age, who had
chondroma of the size of black walnuts on all the fingers
d toes of both hands and both feet. Operation was, of
urse, not thought of, and the patient, who lived in a
all German town (Juebingen), came periodically to
un's clinic, where I was practicing at the time, to be
hibited to physicians and students, more as a surgical
riosity than anything else.* Enchondroma feels hard to
e hand, and their diagnosis on the living is not always
sy. Even when they are situated on the periphery, and
e thoroughly cartilaginous, they have a resistance that
sembles that of bone: they feel as hard as stone, ivory-
e, as a scirrhus of the breast or a true bony tumor
xostosis). This is exceptional, however. They generally
ssess a light, glandular, warty surface, of large size, and
e nodules on the periphery appear to roll themselves
ward, and not to go over directly on to the base of the
mor (soft parts or bones). Exostoses, on the contrary,
ve a smooth or jagged surface, and spread evenly on all
les in the bone substance. The differential diagnosis is
ore difficult as regards fibroids, as enchondroma can
velop themselves, not only in solt parts, but also on bones
d sometimes inside bones, and for this reason can be,
vered with a bony capsule outwardly, formed by pushing
the bone from within.

The only successful treatment is operative. Even this is
t always advisable, unless the tumor, by its position and

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* In this case the tumors were situated on the last rows of phalanges,
the joints.

size, interferes with the function of important parts or threatens danger from expectant breaking out. According to its position, the extirpation may be made by the knife, or with saw and chisel, or we may amputate the part upon which the growth sits. The experience of Dieffenbach in this respect is very valuable, that even after partial extirpation cicatrization can follow. The ossification of pieces of enchondroma left in the wound is regarded as fixed.* If part of the tumor is soft, if it is combined, or is a cystochondroma, we can never count upon anything but a total extirpation. If large arteries run through an enchondroma we may have great difficulty in arresting hemorrhage, in making a partial extirpation, as it is impossible to get hold of the vessel with the pincette, to tie it. As it lies imbedded in the cartilaginous substances, our only recourse s cautery with the iron (actuale); even this does not always suffice. The galvano-caustic would be more likely to meet our wants here than almost any other method.

*The Diagnosis and Treatment of Exostosis.*—Naturally follows, just as enchondroma may become exostoses, and these latter pathologically have the same distinguishing features as enchondroma. We have a soft, porous, spongy exostosis, a hard, ivory-like exostosis, and osteo-cartilaginous exostosis. Exostosis can exist on any bone. It is usually of slow growth, and the soft parts covering such a bone remain healthy. There is no pain during the earlier stages of growth, or even later, unless the exostosis, having attained a very great size, presses severely upon the soft parts, when inflammation may follow, bringing ulceration of the skin, and this in turn succeeded by laying bare the exostosis. Rokitansky and Nélaton attribute the ending in necrosis only to the hard, smoothy-ivory-like growth (exostosis eburnea), probably on account of the great dearth of canals for the blood vessels—Haversian canals. Any of the forms of exostosis may become inflammatory, suppurative and carious. They probably rest upon a dyscrasia, or

* Lebert Loc. cit.

e often hereditary. They may be only one, or many, and
ı different parts of the body. There is but little more to
said as regards these immovable, hard, jagged, or smooth,
ony tumors—in so far as palpation is concerned; there
less that will aid us in making a diagnosis of exostoses if
ey cannot be reached by the hand, on account of lying
ep and being covered with soft parts; for if undoubted
costosis do not exist on other parts of the body, and thus
ad us on the right track, we may as justly attribute the
nctional trouble to a tumor of another class. In com-
rison with enchondroma, the surface of an exostosis is
noother, less nodulated, but often sharp like a cock's comb.
he treatment of exostosis is always difficult, sometimes
ingerous, often useless. We may only expect results from
ntiphlogistic and anti-dyscrasic means, when we have to
, not with a true exostosis, but with an ostephyte still in
ocess of formation; that is, with an inflammation of the
ne or periosteum. True exostosis can only be removed
surgical operation. If its position is such that the oper-
ion would be more dangerous than the further growth of
e tumor, it should be left untouched. If the patient
sires an operation on account of deformity, or great pain,
interference with the use of parts, it may be performed,
ovided there is no special danger. Nevertheless, no mat-
r what plan is adopted for the removal of an exostosis,
ere are all the dangers of a deep-seated suppurration, with
fection of the bone to follow; osteo-myelitis, ending in
æmia, after simple removal of an exostosis, has been
equently observed.

The operation for exostosis, consists: 1st, in sawing off,
*e.*, extirpation of the tumor; 2d, the employment of
ctual cautery; 3d. resection of the part of the bone on
hich the exostosis sits; 4th, amputation of the part
ffected. The ordinary operation, that is, the one that the
eneral practitioner will oftenest have to perform, consists
laying bare, fully and freely, the exostosis by a long
cision, the skin being held back by hooks, one on either

die, in the hands of an assistant; the tumor is then sawed off with the saw, chain saw, or removed by chisel and hammer, care being taken to hold the chisel well down, parallel to the bone. In vascular, spongy exostosis, with broad base, the best method is the pereum caudens, as it gives us a guarantee against profuse bleeding. Only under these circumstances should actual cautery be employed in the removal of exostosis, as it always causes a partial necrosis, followed by inflammation and suppuration. In order to prevent this, it has been proposed to lay bare the exostosis, carefully scrape off the periosteum, and leave the rest to nature. Necrosis of the upper layer may be, of course, expected after this, but it is extremely doubtful if the whole tumor could be sloughed off in this way, Osteoma of the soft parts must be extirpated like other tumors.

*Diagnosis and Treatment of Telangiesasis, Fungus Vasculosis, Mævus.*—These are mostly congenial, sometimes caused by a blow, push, or pressure. Mostly on the outer skin; they may, however, appear on mucous membranes; for example, on the lips. Diagnosis generally easy. They may exist on all parts of the body, varying in color from a bright red to a dusky purple and dark brown, in size from a pin's head to that of a black walnut. They have been mistaken for epithelioma, aneurism, lipoma and varices, but these are extreme exceptions, not likely to be met with in general practice; the characteristics of the tumors mentioned being usually so very marked as to make a mistake difficult; besides, they belong to a more advanced period of life. The forehead is often chosen as their seat. Simple angioma is never malignant, even though local recidiration may occur after incomplete extirpation. My plan is to let a nævus alone, unless it grows rapidly. From the long list of therapeutical and operative measures, the following will be found most useful: Compression by bandage, application of cold and astringents (Abeanethy). If the tumor is a very vascular one, ligature of the artery leading to it, thus preventing further

ngorgement of the veins, the primary cause of telangi-
tasis (and to it these tumors owe their softness when
uched by the hand), also are recommended, the introduc-
on of a seton, the hypodermic injection of percloride of
on (Carter has seen death caused by embolism after this;
is, nevertheless, endorsed by different authorities) *;
rther, the actual cautery, and cautery by medicaments—
lloride of zinc. I tried the lapis infernalis in one case—
e nævus, a small red speck resembling a broken vein,
on the cheek of a little girl about four years of age, at
st increased in size, and then began to diminish, and is
ow disappearing, about the fourth week after the cauter-
ation. They will often do this, however, if left to them-
lves. Concentrated nitric acid applied on the point of a
ne stick, is probably the most effectual caustic. If we
ve a medium-sized and soft warty tumor (nævus,), with
edicle, we may pass a silk thread around and strangulate
—cauterizing the wound surface left with argent nit-
apis). Sir William Ferguson ran two needles through
e base of a nævus; these were armed with silk thread
d were passed through, the one horizontally, the other
rpendicularly; the four ends of the threads left project-
g after the needles were withdrawn were then tied
gether and the nævus thus cut off. If the tumor is a
ngus hematodes, the following application will act very
ell:—

℞. Potas. iodid.,
Aquæ, āā ℥j. M.

This makes an excellent caustic, and will speedily check
e advance of the tumor, if applied every day or two as
casion requires, and contained for some time. If the
langiectasis is of cavernous kind, filled with either blood
lymph, palpitation will give us valuable points, especially
regards fluctuation. If opened, the cavern should be
abbed with a small sponge, wet with a solution of car-
lic acid and glycerine, in equal parts, and dressed with

* Bardeleben-Chirurgie, Vol. 1, p. 428.

adhesive plaster. Great care should be exercised if the diagnosis reveals a cavernous tumor. The galvano-caustic is here, above all, the most sure method, and the one that will give the best reselts.

*Diagnosis and Treatment of Glandular Tumors.—Adenoma.*—The diagnosis of adenoma is readily arrived at from hyperplasia of a gland, on which it always sits. Almost all that has been said with reference to healing tumors by operation and pharmaceutical means holds good here, only we may obtain better results with medicaments and compression in adenoma, than in other tumors. One remarkable case that came under personal observation, was that of a man in middle life, whose left breast being affected with adenoma, had swelled to the size of that of a girl of sixteen years; the nipple was regularly elongated, the tumor soft to the touch and altogether like a normal female breast. No treatment was given, as the tumor had become stationery and was not objected to by the patient.

*Polypi*—Medium hard, bright red or yellowish growths, mostly on mucous membranes, from which they hang by a stem. They are covered with cylinder-epithelium externally; toward the centre they present a mass of thickened mucous membrane, having its origin in a hypertrophy of the minute slime or mucous glands. The cause of their formation is usually to be found in chronic catarrhs, and the nose seems to be their first choice. They are of slow growth, and only cause annoyance by a sense of pressure and fullness in the upper part of the nostril, where their stem allows them to slip up and down, and where they may be easily felt and seen, both from the outside and within. Removal is the only cure. This is quickly, easily and safely accomplished by means of a pair of pincers. The patient, seated in a chair should be made to expirate, by which the polypus will descend a little, when it is firmly grasped with the instrument and torn out. The operation is attended with but insignificant loss of blood, and as regards after treatment, nothing is necessary. Very rarely

e find one at the top of the pharnyx, which if of a more mpact structure, will be best removed by galvano-caus-.

*Sebaceous tumors, cysts, skin tumors, etc.*, are such owths as are contained in dermoid, round sacks, closed, on l sides, the contents being usually either serum or a comsition of fat and lime. The sack itself is a part of the mor. They may also be formed by the encysting of reign bodies, such as a gunshot or bullet. They are often ne to a tendency to fatty degeneration, but little, however, known about their general etiology. They feel hard and nmovable to the touch, are painless and of slow growth. will select one case out of my own practice as illustrave: G. G., aged 35, male, well developed and healthy, nsulted me three years ago about what he supposed to be shot left in the louble of the ear from the discharge of a in. Upon examination I told him it must be a shot, as felt exactly like one in point of size and consistency, and he had a gun discharged at him, other shot having taken fect at the time. Last month he consulted me again, as had declined previously to interfere. The tumor was fter, but still right hard to the touch, aud had grown to ne size of a bird's egg. I operated, making the incision ehind the louble of the ear, in order to conceal the scar, nd extirpating sack and all. The wound was dressed with dhesive plaster only, and healed rapidly per primam. On pening the sack no shot was found, only sebaceous matr. Operation with the knife is the only radical cure in nese cases. A hygroma or gangloin may be punctured, nd its contents thus emptied; flunctuation and softness, ithout inflammation, make then easy to diagnose.—*Med. nd Surg. Reporter*.

## ARTICLE II.

### *Histology of the Nerves; a Contribution of the Latest Researches.**

BY FRANK DUDLEY BEANE, A. M., M. D., OF NEW YORK CITY,

Ex-Fellow of the Mass. Med. Society; Ex-Member of the New York County Med. Society, etc.

The recently-issued work of M. Ranvier contains a mine of wealth for those whose knowledge of the French language, and leisure permits them to explore the deeply-hidden and very interesting facts relative to the histology of the nerves.

To lay before the mass of the profession the salient and essential data of the latest and most reliable researches in an English dress is the object of the translator, whose belief in their value to the profession at large is his excuse for the publication of this paper.

*Cerebro-Spinal Nerves.*—The spinal and cerebral nerves proper are called, on account of their special constitution, *myelinic.* They are white, more or less opaque, emitting and reflecting light like watered silk. As Fontana † first pointed out, this pearly appearance is due to simple folds from which the light is reflected. If the nerve be stretched, these folds are seen to disappear. These folds are due to a zigzag arrangement of the nerve tube within the nerve when its sheath, by reason of its elasticity, has folded upon itself.

If a segment be removed from a nerve of a living animal (frog, rabbit, etc.) And allowed to rest in distilled water upon a glass slide, we see, after a certain time, masses of matter exude from the cut extremities, which possess the form of clews of transparent filaments. The latter gradu-

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* Translated, abridge and arranged from "Lecons sur l' Histologie du Systeme Nerveux," par L. Ranvier, Professeur de l' Anatomie Generale au College de France. Paris. 1878.

† "Traite du Venin de la Vipere," t. ii, p. 202.

ally swell, their contour becomes less clear, they seem to dissolve one into the other, and, after half or one hour, the clews become divided into ball-like masses of varied form, double contour, highly refracting border, and concentric striæ, the latter somewhat reminding one of the original filaments; these masses free themselves from one another and float away to another portion of the microscopic field. They possess forms intermediate of the cylindrical and spherical. This medullary substance of nerve-tubes is called *myelin*, whence the designation of this kind of nerves.

If the nerve segment be undisturbed within the water, this process of oozing of the myelin would continue until a more or less extensive portion of the segment were completely freed of its medulla, leaving behind what, at first, appears to be simply a connective-tissue envelope. The *connective-tissue sheaths* of large nerve-trunks are three in number, from without inward:

*a.* The Perifascicular.
*b.* The Laminated.
*c.* The Intrafascicular.

A segment taken from a dog's sciatic nerve (which is composed of several fasciculi), and properly prepared * gives a specimen which beautifully shows the former two. The field shows the whole nerve as surrounded by an envelope of diffuse connective tissue, which also dips down and binds the various fasciculi together; this is the nerve's *perifasciculi sheath.*

Internal to the latter, and surrounding each fasciculus another envelope is seen, called the *laminated sheath.* Within, seemingly as offshoots from this sheath, appear delicate layers of connective-tissue which join each other here and there, forming, by their interspaces, compartments within the laminated sheath. These layers form what is called the *intrafascicular sheath.*

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* Techanical details are necessarily omitted from this paper; the reader is referred to the original, where the minutest directions and best methods shall be found.—TRANSALATOR.

The compartments thereby formed, as well as the peri fascicular sheath contain blood vessels.

Let us examine these various envelopes more in detail.

*Perifascicular Sheath.*—As mentioned above, this envelope surrounds the whole nerve as well as, by its prolongations, solders the different fascicula together. It is composed of diffuse connective-tissue, otherwise called cellular or areolar tissue. It is constituted by connective filaments, elastic fibres, flat cells, fat cells, blood vessels and lymphatics. The connective fibres, unlike those found elsewhere, do not intercross in all directions, but pursue a longitudinal course. The elastic tissue networks also present their elongated meshes in the direction of the nerve's axis. The fat cells are disposed in small elongated groups the long diameter of which is parallel to the direction of the nerve-cord. The more internal portion of this sheath (*i. e.* nearest the nerve fasciculi) assume the form of laminæ the filaments of which are, however, thick, large, and independent of each other. A properly prepared section shows their arrangement in the form of the leaves of an open book. These laminæ, instead of being composed of a trellis of delicate fibres like the laminated sheath, are compared to the latter, only coarse mats. Indeed, it is impossible to draw a perfectly defined line between the connective-tissue of the perifascicular sheath and that constituting the laminated sheath proper. The distinction is arbitrarily based upon the fact that the filaments of the latter sheath are the more delicate. It is through the perifascicular sheath that the nerve is bound to the surrounding tissues.

*Laminated Sheath.*—This envelope, lying internal to the former, completely surrounds each fasciculus of nerve-tubes. A property prepared transverse section would show this sheath as composed of superimposed concentric layers.

If another section be prepared with silver nitrate, this sheath is seen to be constituted by a series of laminæ, each separated from the other by black, granular, often irregular

nes, due to the staining material. The number of the minæ depends upon the size of the nerve under examina- on; in this sheath of a single fasciculus, from a dog's iatic nerve, ten to fourteen may be counted. In the rab- t they are fewer, more delicate, and so extensible that e injection separates them very fully.

The structure of these laminæ is made up of a *stroma* d *endothelial cells*, applied to the surface of the stroma. a very delicate shred of this sheath be stripped off—so to isolate, as nearly as possible, a single laminæ—and one two drops of Bœhmer's solution of hœmatoxylon be lowed to fall upon it, if then it be washed in distilled ater, and examined in glycerine, we shall see:

1. A slightly tinted (bluish) stroma of very delicate aments, which decussate in such a manner as to form a twork with irregular interstices.

2. Very deeply tinted nuclei, irregularly oval, variable size, with a distinct nucleolous. There are in immediate ntact with the stroma.

3. A homogeneous, transparent, delicate, slightly tinted yer, which unites the nuclei to each other.

The latter two form *endothelial layer* of the laminated sheath. The layer, which connects the cells, is seen to present very licate striæ which intersect each other at right-angles, and less highly tinted than the nuclei proper. This layer is also nner than the nuclei.

In man, the nuclei are so joined together (using the choroid mbrane) that it is impossible to clearly distinguish the above- scribed characters; but if the chorid of a dog be used, we them beautifully marked. Each face of the laminæ, which npose this sheath, is carpeted (so as to speak) by an endoth- al layer. This fact can be well demonstrated in a specially- pared Pacinian corpuscle; at times, by chance, we can see arrangement in the laminated sheath of a nerve-fasciculus en properly prepared.

Between the different layers of this sheath are interspaces of egular shape; these inter-lamellar interstices should be garded as *serous* interspaces.

As M. Cruveilhier pointed out, in 1835, the laminated sheath should be considered a serous membrane, since, like all serous membranes, it is covered by endothelium. Besides the above constituents, this sheath contains, on the surface of each lamina, a species of network of delicate elastic fibres. A properly prepared specimen shows a species of plates with irregular contour. a central foramen, and the plates giving off fibrially prolongations from the periphery. These prolongations appear like a series of beads strung together as in a necklace. Similar grains or beads are sometimes irregularly distributed around the edge of the plate or its vicinity.

These plates, prolongations and grains are homologous in structure, powerfully refract light, are insoluble in acids and weak alkaline solutions, and are colored yellow by picric acid. The elastic tissue of this sheath appears in no other form than that just described, and it is extra—or pericellular, *i. e.*, developed external to the endothelial layer.

In the external laminæ of this sheath, round or oval openings are seen. They may appear as single foramina, or as one, two, three or more openings, lying side by side, with simple partitions between them.

The laminated sheath is pierced by arteries and veins of such size as to be visible to the naked eye, but no blood vessels are disturbed upon or within it.

*Intrafascicular Sheath.*—Between the nerve-tubes of each fasciculous the laminated sheath sends, from its most internal layers, partitions, which, dividing and subdividing, becoming thinner and thinner, divide the fasciculus into a great number of compartments. These partitions are the *intrafascicular lamina.* Finally, around each nerve-tube of the fasciculus. a very delicate sheath of connective tissue is found, and this membrane is called the *intrafascicular connective-tissue proper.* Whether this latter takes its origin from the former or from the internal layers of the laminated sheath, or whether it originates from neither, is not a settled question.

The intrafascicular connective-tissue *proper* is composed of fibres and cells.

If a nerve-cord be disassociated, (*i. e.*, nerve-tubes be separated from each other), after the action of acid osmic, we see that

:h nerve-tube is surrounded by a certain number of exceed- ;ly delicate, slightly undulating fibrils, the direction of which parallel to the nerve-tube. If another portion of this pre red cord be stained by hœmatoxylon or picro carmine, we :ognize cellular plates upon the surface of the fibrils. These lls are irregular in contour, and give off prolongations which not join one cell to another, at least I have never seen them so.

After detaching one of these cells, we find it does not pos- s a plane surface, but turns up its sides like a gutter-tile, us preserving its normal shape around the nerve-tube. Some rts of its surface are thicker than others, its nuclei participat- ; in this condition, which is due to depressions produced by pressure of the neighboring connective-tissue fibres and of nerve-tube itself.

The intrafascicular laminæ are supplied with blood vessels.

*Henle's Sheath.*—Descending the scale, following nerve-cords a nerve of a single fasciculus, thence to a *funiculus* contain- ; only two, three, or five individual nerve-tubes, we should d that this extremely small funiculus is surrounded by its own ath, distinct from those already described.

This special sheath should be considered simply as the sub- tute for the laminated and intrafascicular sheaths, which are t before the division of the fasciculus into these small funic- . This sheath, which also envelops nerves composed of even *ingle nerve-tube*, is the *sheath of Henle*, named after its dis- verer.*

A segment of a lizard's (preferable) or frog's muscular nerve its peripheral termination, where it is composed of a single rve-tube, placed under the microscope, shows it to be sur- unded by an external membrane, beneath which are nuclei bedded in a mass of protoplasm. The membrane is pliant, as idenced by the folds which are produced by the manipula- n. It is carpeted on its internal surface (to which they adhere) the above-mentioned nuclei, and, here and there on its ernal surface, we see the flat cells of its connective-tissue vestment. A third species of cells are seen to cover the rve-tube itself, beneath and absolutely distinct from the sheath Henle.

* "Anatomie des Menschen;" edition of 1848.

If now a rat's or mouse's thoracic nerve be prepared with silver nitrate we see, beneath the connective-tissue which binds the nerve to the various external tissues, black lines which form large, irregular polygons, by their intervals. These lines correspond to spaces between the polygons, which latter are endothelial cells; the inter-polygonal spaces are filled up by an extremely delicate layer of intercellular cement. By carefully observing the specimen, we should see that there is a double *reseau* of black lines which intercross each other, thus demonstrating there are two layers of endothelium which are closely applied to each other.

The membrane of Henle's sheath is composed of connective-tissue.

*En resume*, Henle's sheath is constituted by:

1. A connective-tissue membrane.
2. Lined internally by a layer of endothelial cells.
3. Internal to and distinct from the latter are nucleated cells which lie upon the nerve-funiculus or nerve-tube.

*Myelic Nerve-Tubes.*—Their structure presents a very interesting study to the histologist.

If a single nerve-tube be isolated, stripped of its sheath of Henle, and a segment be removed, placed upon a slide in a drop of distilled water, and examined under the microscope, the myelin is seen to comport itself in the same manner as described on page 254. The connective-tissue membrane seen at the end which has collapsed is the true envelope of the nerve-tube, first described by Schwann, and called after him, Schwann's sheath.

[TO BE CONTINUED.]

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## ARTICLE III.

### *American Dental Association.*—(CONTINUED).

THIRD DAY—MORNING.

Dr. J. M. Odell read a paper on diathesis and cachexia and their influence on diseases, and pointed out the necessity of a more thorough knowledge of the family history.

Dr. Atkinson: There is a diffence of opinion as to heredity, and we should take the middle ground.

Dr. Geo. F. Friedrich: Few, if any, medical men understand the *modus operandi* of the medicines they prescribe, and it is nonsense to talk of the molecular affinity of the medicines for the tissue. In a discussion of this kind no facts are brought forward, and we come to no definite conclusions.

Dr. T. L. Buckingham; We use medicine as we do lubricants in machinery. If we put turpentine on a bearing we soon have friction that rapidly wears out the mchine; we do not know how these medicines act, but we know that if we put certain medicines into the machinery we get certain effects. Some act as a whole, some by decomposition. The composition of some substances is nearly like certain articles of food, but like a word, the transposition of whose letters makes an entirely different word.

Dr. Watt: The statement that we do not understand how medicine act is too general. We do not understand how some medicines act, and yet of others. Knowledge is partial. In the treatment of autumnal fevers with arsenous acid, it is administered to interfere with the cause and the root of the disease and kill the morbid tissues. We expect it to kill the morbid tissues and leave the live ones intact. In an anæmic girl, where there is a lack of red corpuscles and, as iron will produce red corpuscles, we should administer it in a form that is most assimilable, or we may give iron by hydrogen and direct the patient to sprinkle it on her bread and butter. It is contented that this form of iron is not assimilable, but I have prescribed it and it has produced the desired result.

Dr. Friedricks; Physicians are supposed to know the cause of a disease before they treat it. Now, what is the cause of fever?

Dr. Watt: That question was settled some time ago, but few people know that it is settled.

Dr. W. O. Kulp, Davenport, Iowa (to Dr. Watt): Perhaps the reason of the iron having the desired effect was because of its being sprinkled on bread and butter.

Dr. Odell: I think Dr. Watt made out a clear case that he did not know any thing about the action of medicines. Dr. Friedrichs is right. There is always a point beyond which we cannot go; we cannot get at the how they operate. Some act by assimilation, others by presence, as Bismuth. Dr. Watt simply stated that arsenic cures certain diseases, but did not give us a glimmering of its *modus operandi*. It is supposed to act on the nervous system, and by a molecular motion cause the elimination of certain substances.

Dr. Watt: We do know that these substances die under the influence of arsenic, and they and the arsenic come out together, thereby giving the system a chance to act by dunging it out, as they say in West Pennsylvania. We know as much about some medicines as we know about anything. We know a plow turns a furrow and pulverizes the soil, yet we cannot explain how it is done.

Dr. Odell: About all we know about medicine is at first empirical. Science is simplya classification of empirical knowledge. Some one discovers a result, and we go to work to discover how it is produced, but we have never yet found out how this is done except in the case of the oxygenation of the blood.

Dr. Atkinson: We talk of stimulant and tonics; how do they act? The body is made up of molecules; any impact that enters into a molecule and becomes part of it is a tonic, and any impact that accelerates molecular action is a stimulant; every atom has a static and a dynamic side. It is difficult to imagine the creation of atoms; any substance that can act as a molecule will, according to the condition of the molecule, act as a food or poison.

Dr. Friedrichs: Does any one else believe that?

Prof. Mayr: Dr. Watt says that arsenic kills organisms. In my laboratory I had too bottles, one containing a solution of arsenious acid, and the other arsenite of soda, and the liquid in both bottles became covered with mould. I consider arsenic a stimulant of the nervous system.

Dr. E. T. Darby: We do not know how arsenic acts on a pulp. Opinions differ. Dr. Flagg made some experi-

ments with arsenic. He took one twenty-fifth of a grain on a piece of cotton and applied it to pulp and devitalized it. He then applied the same arsenic to another pulp with the same result, and so on until he had devitalized ten pulps. He then applied it to the web of a frog's foot and killed it. The question is, how was it possible to acomplish those results?

Dr. T. L. Buckingham: I think I know something about that frog. We found what we supposed to be arsenic in all parts of it. We do know that a very small quantity of arsenic will have a good deal of effect, but this does not prove that it may not be absorbed. I do not know how it destroys pulps. When arsenic is applied to tumor, it attack the weakest tissues first, which makes a cushion that retards its action. We cannot say why sulphur and oxygen combine. There are law that regulate them like letters which can be put together, but must be put in such shape as to form words. We know nothing about matter; we only know it by its properties, not by its substance.

Dr. Watt: Does not arsenious acid coagulate albumen?

Dr. Buckingham: Yes.

Prof. Mayr: Has anybody ever noticed that arsenic coagulates album?

Dr. Buckingham: We know that immersing seeds in a solution of arsenic will prevent their germinating, and after it has been applied to the pulp, and that organ is apparently dead, the arsenic may be removed by syringing with water and the pulp restored to life. It paralyzes, it acts in the same way as cold.

Dr. George R. Thomas, Detroit: Can the arsenic be removed and the pulp be restored to life again?

Dr. Buckingham: There is a mere suspension of vitality.

Dr. W. W. Allport. Chicago: It is difficult to explain why remedies act; we only know they do act. We know not how we live; Dr. Flagg's experiments were not thoroughly understood; he wished to prove that it destroyed vitality, was not due to absorption, but it acted as an irri

tant, and he showed that it did not exist in the pulp save at the point of contact· The irritation of the pulp caused congestion and strangulation at the apex. I have found that when the pulp has not been wounded that it takes the least quantity of arsenic to destroy it, but when it has been wounded it takes a larger quantity; this is due to a loss of blood. In other cases I have introduced a quantity of arsenic, and in a few days afterward a portion of the pulp 'has sloughed off and the rest of the organ remained alive for years.

Dr. J. N. Crouse, chairman of the committee appointed to draft resolutions in memory of the late Dr. M. S. Dean, of Chicago, reported a paper, which was ordered spread on the memorial page of the transactions of the association. It states that in the sad bereavement they had lost the companionship of one whe was original and progessive in thought, though calm and conservative in action, and just and charitable in expressing his convictions, posessing keen perceptions, delicate sensibilities, and refined tastes; he was pure, warmheated, and sympathetic in nature, genial, humorous, witty, and at times even boyish and exuberant in spirits. With these attributes governing his life he enjoyed to an unusual degree the confidence and affection of his associates. They had lost a scholarly, cultivated, and generous friend, who has filled with honor and great satisfaction every responsible position at their disposal. His brillant intellectual attainments, earnest, honest, and modest bearing, made him not less dear to their scientific friends abroad than to themselves. The heartfelt sympathies of the association were accorded to the bereaved family.

Dr. W. C. Barrett, Chairman of Section 7, on physiology and etiology, reported the great impotance of this new section, and in reference to a suggestion in the President's address the following was read: That the sum of $200 be set apart to be adjudged by a special committee of three membes to be appointed by the president of the Association to the author of the best paper on the etiology of dental

ries, the paper to be based upon strictly original investtion, and to be presented to this Association in the report Section 7. Such committee shall prescribe the condions upon which essays shall be presented, and in case of o or more papers of equal claim to merit they may in eir discretion divide the sum so set apart and award a rtion to each essayist. Unless papers of sufficiently iginal merit be submitted, the committee may decline to ard the prize, and hold it over until it has been fairly rned. The competitors for the prize essay need not be embers of this Association, but the profession of the orld is invited to the consideration of the subject.

Dr. Barrett also read a paper on "The Origin of Nervs Force." It explained the origin of nervous force, he d, and endeavored to prove, that it was a correlation original force—force as it is in general and in its essence. that sense it was a continuation or a complement ot ginal forces, such as heat, electricity, and like these, it s derived from the molecular action of chemical affinitee. He mentioned an example of his position which he had en recently at a meeting of a State Dental Association. had exposed the inside organs of a dog—the heart had en bared to view. Soon the beating of the heart ceased, though life were extinct. Some friends of his had retired d declared that his experiment was a failure. But he d it was not, and applied a shock of electricity, at the ne time infusing the proper amount of heat. The result s that the heart began to beat as regularly as before the eration commenced. The scientific research of the day s for the conservation of nervous force.

At the conclusion of Dr. Barrett's paper Dr. Buckingn made some remarks, but owning to the noise and fusion they were inaunible.—*Rep*).

THIRD DAY—AFTERNOON.

After deciding to meet at Niagara next year the Association went into an election of officers for the ensuing year with following result.

Dr. W. H. Goddard, of Louisville, President; Dr. Ge J. Freidrichs, of New Orleans, First Vice President; D A. W. Harlan, of Chicago, Corresponding Secretary; D Geo. H. Cushing, of Chicago, Recording Secretary; D Ceo. W. Keely, of Xenia, Ohio, Treasurer; Executi Committee, Dr. F. M. Odell, T. T. Moore, S. G. Perr C. N. Pierce, W. H. Morgan, F. H. Rehwinkle, Dr. J. I Course, Dr. A. M. Dudley, G. H. H. Field.

FOURTH DAY—MORNING.

During the morning session the matter of appropriating certain amount for best original essays on Dental Cari was considered, and it was decided to appropriate $200 f that purpose. Dr. Buckingham, of Philadelphia, explaine the substance of a paper on artificial dentistry. He referre to the importance of the use of celluloid in the manufactur of teeth. Celluloid, by the application of heat from 290 to 310° well regulated by a thermoneter, might be put int such a condition as to be easily pliant to any form. H deprecated the fact that so many dentists were careless i the manufacture of teeth. They made a set of teeth, f instance, for an old man as though he was scarcely twent one—thus the naturalness of teeth was not at all preserve Celluloid would not only be plastic, but would recei any color. Dr. Dorrance, of Ann Arbor, Mich., read paper on the ill results of vegetable bases. He also exhi ited a new blowpipe, and specified a new compound f solder made of silver zinc, and copper. Upon motion Dr. Barett, it was resolved to declare the sense of the mee ing to be that the new blowpipe be manufactured by th inventor for the benefit of dentists.

In the afternoon President elect Goddard was installe as the presiding officer. He made a strong address in takin the chair, which was loudly applauded. He closed it b saying: "And I assume the gravel feeling a consciousne of success." Some time was spent by seveal member expressing their sentiments in regard to the deaths of D Hawxhurst and Dr. Dean.

Dr. Taft read a paper on dental literature. The United tates, the Doctor said had a larger number of dental jour als than the world besides. The dental journals of the Inited States contain each month 425 pages 5,100 per year he British Journals contained 1,692 pages per year, the rench 984, making in all, 4,824 pages. According to this timate the periodical literanre of the United States ceeded that of all other countries by 276 pages.

Dr. J. W. Cronse, read a paper on Dental Education. e took the position that, on account of the award of diplo as, college education had been deteriorated. The paper ovoked considerable discussion. Dr. Atkinson, of New ork said the time of graduation had nothing to do with e two, three, or even ten years, made little difference as his knowledge unless in that time he had acquired it. ental education had grown, but, not like ripe fruit, it had come abundant, but its fruits green. Only by honesty ould the dental profersion attain to a decent standard of ucation. Dr. Pierce insisted on the importance of a ate Board of Examiners being appointed, taking the duty examination entirely out of the hands of a faculty. Dr. arrett, of Buffalo, favored this view, but qualified his posi on by saying that in the present condition of things it was ry important to require a course of a certain number of ars from the colleges, otherwise the abuse of granting plomas would be on the increase. Dr. J. Taft said it was sy enough to describe an evil, but to apply a suitable medy was a difficult matter. Dr. Morgan, of Nashville, d it was not true that responsible colleges were wont to ant diglomas where they were not deserved. He did not lieve in a State Board of Examiners, because a professor the college, who taught the student every day, was the ly competent man to examine him. He was diametrically posed to a union of medical and dental colleges. Dental dents ought to be educated in dental colleges by dental ofessors. Dr. Allport, of Chicago, averred that it was use s to build up dental science on any other foundation than

that of medicine. The greatest quacks were the graduates of dental colleges. Dr. Hunter took the position that a good dental education must first be acquired in a regular medical college. Drs. Barrett, Chas. Butler, and Field, were appointe a committee to make arrangements for the accommodation of members at next place of meeting at Niagara Falls, to act in concert with the first division of the Executive Committee. Dr. Darby, of Pennsylvania, and Dr. Harlan of Chicago, were appointed the committee on publication.—*Cin-cinnati Lancet aud Clinic.*

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## ARTICLE IV.

### *Review of the Progress in Histology.*

BY DR. S. E. DAVENPORT, OF NEW YORK.

[Read before the Connecticut Valley Dental Society, at Amherst, Mass., June, 1882.]

The chairman of Section 1 desires to thank *all* the members of the section for the very cordial support he has received, and particularly those who have taken any notice of his appeals for aid, even though it may have been with a "not prepared."

The dentist should have a good knowledge of general anatomy, and an accurate understanding of the arrangement of the tissues entering into the formation of, and lying contiguous to, the buccal cavity. In England the student of denistry is required to pass as rigid an examination upon anatomy as is the student of medicine. In this country a full course of dissection has been made compulsory at many of our dental colleges, while at the excellent institution of Harvard and the Dental Department of the University of Pennsylvania, the instruction and requirements are in every way the same, for the dental as for the medical students, in both anatomy and physiology.

In those dental colleges where a course of dissection is not obligatory, many students shrank from taking the same,

rtly from feelings of disgust and horror at the idea of nding so much time in close proximity to the cadavera. at feeling soon disappears upon the use of the scalpel, l the testimony of all who are really interested in anaty will probably agree with that of the writer, in calling ne at the dissecting table both profitably and pleasantly nt.

The department of physiology was accepted by a mem- of the section, but his necessary absence from home for eral weeks has prevented the preparation of his report.)

The idea that animals and plants, however complex their ucture, are composed of a limited variety of elementary rts, has been held for many centuries. Aristotle referred it in his writings, while Galen, the father of medical ence, went so far as to claim that what we now call tis-es, muscle, nerve, bone, cartilage, tendon, etc., were the imate elementary parts, or "*partes similares*," as he led them. It would seem strange that Galen, and the atomists of his time, should claim that in the "*partes sim-res*" they had arrived at parts no longer analyzable, did not appreciate the difficulties which beset the path of stologist in those days in the absence of compound micro-ope. To be sure, we know that simple lenses were own to the Greeks and Romans over twenty centuries ago, t their use was confined to the generation of heat by the fraction of the Sun's rays, and the magnifying possible with e simple lens, until, in 1590, the Jansens of Holland nbined the power of two lenses and formed the first com-und microscope.

The next attempt at the discovery of ultimate physical ement was made by Haller, who in the eighteenth century omulgated the fiber theory, claiming that all tissues were mposed of fibres and an interconnecting organized con-ete. In the early part of the present century their peared the writings of a large number of observers who aimed the fiber of Haller was not the ultimate element t that it could be separated into globules, which, they

claimed, would form fibers, veins, arteries, etc., by the linear apposition and connection of these ultimate globular elements. All these writers agreed that there was a structureless, semi-fluid, glue-giving, intermediate material of which some tissues, notably cartilage, were for the most part composed.

The cell doctrine, as it is called, had for its founders the two eminent German histologist, Schleiden and Schwann, who in 1838–9 published their views—those of Schleiden be ing based his study of the minute structure of plants, and Schwann's upon the application of Schleiden conclusions to the histology of the animal tissues. There cannot be too much credit given to Drs. Schleiden and Schwann for their patient labor with the microscope, for the cell theory, although incorrect in its claims as to the presence of cells distinct and separate—the unit upon which all development depends—was a great advance upon all the theories previously promulgated, and was so beautiful when explained and understood as to stamp each student who gave it attention an ardent admirer of histology forever. The writer confesses that he was much grieved when first it was demonstrated to him that the cell theory was not tenable. There was something so satisfactory in the idea of being built up of six or eight different kinds of cells, varying in shape according to the special needs of the locality, and the student imagined he could feel the blood pabulum coursing through his arteries, and when it reached the capillaries, there came the gentle though discernible grasp of the cell nucleolus, which metamorphosed the pabulum into living matters—soon losing its life, however—being changed gradually into nucleolus, cell contents, and then formed material—this last being just outside that ever prent but never seen "cellwall," which has, in the much controversy regarding it, been likened to everything from the skin of an orange to the halo about Cupid's head.

Then, too, if it was ever our misfortune to meet with a person whose good nature was not sufficiently developed to enable him to bear all of our peculiarities, under the cell doctrine we could charitably conclude that in his organiza-

the squamous and polar cells had unfortunately been sposed, or that when he was formed, the usual variety ells not being obtainable, he had been obliged to close a job lot of perhaps "*wandering*" cells. Now all is ged. No longer can we liken the human frame to a mney, built up like it with cells for bricks, entirely separ- and individual except for the mortar-like connection ded by the intermediate formed material.

et us hope that with the loss of our chimney all *smoke* also vanished, and that the views held to-day by Carl zmann and his disciples may prove as true through as to the earnest student they now appear to be.

arl Heitman was born in the year 1836 at the southern tary boundary of Hungary, where his father was on duty n army surgeon. Inheriting a strong liking for medicine surgery, he studied these sciences first in Pest, the cap- of Hnhgary, and Vienna, Austria. In 1859 he grad- d with honor at the University of Vienna, and was ediatly elected assistant surgeon to the late eminent . Schulh. In 1862 he became associated with the late . Hebra, who soon published the greatest work on skin ases in existence—six of the ten volumes being illustrated Carl Heitzmann.

uring the next five years Dr. Heitzmann pursued sur- l, anatomical and hisological studies, and illustrated and ed several works upon surgery and anatomy. His Manual urgey, two volumes, has reach five editions and is trans- l into several languages, while Anatomy, also two vol- s, containing 600 large wood cuts, has reached two edi- s. His first histological researches were published in , and were upon the minute anatomy of the small stine.

1872, '73 and '74 there appeared in the Transactions he Imperal Academy of Science, in Vienna, various rs by Carl Heitzmann upon general histology, the and peculiar claims of which although scoffed at at the by the originators and supporters of the cell theory,

were destined soon to overthrow that theory and to make converts of many who at first were loudest in their jeering. Early in the year 1874 Dr. Heitzmann was elected Lecturer of Morbid Anatomy in the University of Vienna, where he was in the direct line of promotion to the Chair of morbid Antomy, to succeed the late Rokitansky; but on account of the new views upon histology held by him, and the jealousies of his fellow-workers, another man was elected to the professorship, Carl Heitzmann was disappointed, and with a desire for surroundings less oppressive, and with less deep ruts in which he was expected to run, came to New York toward the end of the year 1874 and established his laboratory.

It may be stated here that Carl Heitzmann made most of his discoveries while working in the laboratory of Stricker Professor of General Pathology in the University of Vienna, and had not Stricker worked against him and refused to accept his discoveries as true, Heitzmann would have had the professorship he wanted. However, in 1880, Stricker published the results of researches of his own, principally regarding the cornea, and accepted fully Heitzmann's claims of six years previous. The English physiologist, Drysdale, in 1865, compared the cell to a gun barrel without lock or stock—so imperfect did the theory seem to him, and this was after Lionel Beale and Max Schultze had established their protoplasma theory, which they tried to conform to the cell theory. Heitzmann felt the same dissatisfaction with the so-called cell doctrine, though with greater force, and resolved to prove it true or to disprove it if it was, as he thought, false.

Upon Schwann's investigation of the constitution of cartilage, his cell doctrine was to a great extent based. Heitzmann's bioplasson doctrine was formed from what he saw in his examinations of the same tissue, though it would seem to be the least suited of all tissues for the demonstration of his peculiar claims, on account of the large proportion of basis substance. Heitzmann found the formerly supposed

n-connecting cartilage cells to be mases of living matter, c nuclei and granules of which were connected by fine nes of a protoplasmic nature, making a network within d that each corpuscle the corpuscle was connected with l others in the vicinity by means of—to use the appropriate rm suggested by Prof. L. Elsberg of New York—a bio-asson reticulum, which pierced the gule-yielding basis-sub-ance in all directions. Dr. Heitzmann has demonstrated at the formerly so called protoplasm of tissue in general is t, as was supposed, stuctureless, but that it has a reticular ructure, the reticulum being the living matter proper, on c contraction and extention of which depends the change the shape and locomotion in the simplest animal organism, the highest organs of man. Not only is there a connec-on by means of the reticulum between all portions of liv-g matter in the same tissue, but the bioplasson of each sue is intimately connected, by fine off-shoots, with that the tissue lying contiguous to it. This body of ours, en, in place of being made up of colonies of structureless nœba, as claimed by Hæckel and Huxley, may be said to semble an enormous amœba, with a bioplasson reticulum solutely literally connected throughout, enclosing in its eshes of the accompanying basis-substance enclose a glue-ving material, which is the lifeless fluid above referred to, emically changed and solidified. Isolated lumps of liv-g matter are found only suspended in the liquids, blood d lymph, and in the different.

Two year ago A. Spine, of Vienna, treating cartilage th alcohol, discovered a ready and simple means for monstrating the connection of the cartilage corpuscles— simple, indeed that to-day an eye little experienced, and th comparatively low power, con see what in 1873 Carl eitzmann maintained, based upon rather tedious method staining the cartilage with nitrate of silver and chloride gold. Carl Heitzmann's laboratory comprises the entire urth floor of his residence and is a convenient and well-ghted apartment. The number of work tables, at first

four, is now seventeen, this large increase having been necessitated by the rapid filling up of the classes, over 700 gentlemen having studied there since the laboratory was established.

The study of the minute anatomy of the teeth has made remarkable progress during the last four years, and principally through the efforts of Carl Heitzmann and a few co-workers, among whom is Dr. C. F. W. Bödecker, of New York, who has contributed the most knowledge to the departments included in this section. It may be well to refer briefly to a few of the most important discoveries by Dr. Bödecker and others concerning the structure and relative arrangement of the organic and inorganic constituents of the dental organ—based, all of them, as far as possible, upon C. Heitzmann's bioplasson doctrine.

Much advantage was gained by these gentlemen in not confining their examinations to specimens cut from the dried tooth—it being easily seen that in the progress of drying, the soft tissues would shrink, lose their form and occupy much less space than during life. Then, too, dried specimens have to be round; consequently, the syaces (lacunæ, tubuli, etc.) would collect more or less dirt, which would confuse the examiner, dirt not always having its name upon its face so that it may be recognized as such. Fresh speci mens were cut with the razor from teeth which had been immersed in a one-half to one per cent. solution of chromic acid.

It is not necessary to go into the late methods of preparing specimens, which are many—all tending toward the preservation of the form and natural position of the soft tissues and the prevention of the accumulation of foreign substances. The dentinal tubuli radiate from the boundary of the pulp canal, differing in curvature according as they are directed toward crown, neck or root of the tooth. Each tubule or canaliculus runs in a wavy course, branching usually only as it approaches enamel or cementum, and contains a slightly beaded fibre which is smaller than the

alibre of the canaliculus. From the periphery of these ibres fine off-shoots may be seen, with high power, which point toward corresponding opening in the walls of the analicali, though they are often so fine as to prevent the examiner from really seeing their exit through these little pening; but in stained specimens a fine reticulum of bioplasson can plainly be seen piercing the basis-substance etween the canaliculi, and its connection with the dentinal fibres is shown at many if not all points. The canaliuli and their contents branch and ramify in an exaggerated nanner as they approach the enamel and cementum, the ncreased sensitiveness of dentine at these points during ental operations being accounted for by the presence of a rger proportion of living matter. The dentinal fibres are onnected with the odontoblasts of the pulp in the growing ooth and with its protoplasmic bodies in the adult tooth, o regular odontoblasts being present. The periphery of he dentine next the cementum does not contain canaliculi, finely granular layer varying in thickness being found ere, the bay-like excavation seen at the juncture of dentine and cementum often containing protoplasmic bodies ossessing off-shoots which serve to connect the branches f the dentinal fibres with those of the cement corpuscles. his layer of protoplasmic bodies between dentine and ementum, as also between dentine and enamel, has been amed by Dr. W. H. Atkinson the interzonal layer.

The connection of the dentinal fibers, with the cement orpuscles is also established by the anastomosis of the bres, or their large branches, with the coarser off-shoots om the protoplasmic bodies of the cementum, and by the ne reticulm of the basis-substance of the dentine passing to that of the cementum. This is the only method of nnection at the neck of the tooth, the dentinal reticulum arting from small pear-shaped enlargements on the terminations of the fibres.

The connection can also be seen between the living matr of the cementum and nucleated protoplasmic bodies of

the pericementum, excepting at the neck of the tooth, where the cementum is covered by epithelial elements which turn over into the epithelial coating of the gum, and closely resembling those comprising the so-called Nasmyth's membrane which covers the enamel of the young tooth.

Tomes describes the human enamel as a structure containing but 3.5 per cent. of organic matter, the remaining 96.5 per cent. being lime-salts. He tells us of the enamel rods, has much to say about their shape, their wavy course, etc., and then adds: "The rods are solid, are in absolute contact with one another and have no demonstrable intervening or uniting substance."

Dr. Bödecker also admits the existence of the enamel rods and agrees with Tomes in regard to their course, etc., but he sees and demonstrates to others the existence of what he calls "enamel fibres" of living matter in the interstices between the rods. Branching from these fibers at right angles with them there may be seen minute conical fibrillæ which traverse the space between the fibres and the contiguous rods, enter the rods and are then lost to view, though in the thoroughly decalcified specimens these fibrillæ may be seen traversing the substance of the rods proper, and uniting to form a network similar to the reticulum in the basis-substance of the dentine. Tomes informs us of the existence of organic matter in enamel, but does not tell us in what form or at what points it may be found. Böaecker not only gives us full information in regard to the position of the organic matter, but he prepares specimens and adjusts them so that the novice can see this fine reticulum in the enamel rods.

Dr. Bödecker has also demonstrated the morbid changes which take place in the formation of secondary dentine and in inflammation of the peri-cementum and pulp—all of which has been written up in the able manner characteristic of him, and published in the *Cosmos*.

Dr. Frank Abbott has spent much time in the examination of tooth caries, and, though the subject is too formida-

ble to be mastered by the researches of one man, he has certainly added much to our knowledge of that pathological condition. He is at present pursuing studies concerning the changes of the dental tissues during the process of absorption of the teeth of the first dentition.

A very valuable book, and one which we will all want, is soon to be issued from a New York press. It is from the pen of Dr. Heitzmann, is upon general histology and microscopy, and its title is "Microscopic Morphology." It will contain a complete explanation of Dr. Heitzmann's views as well as the researches of a number of its co-workers, including Dr. L. Elsberg of New York, and it will not only be a very interesting work but the most valuable one for the advancement of science which has been published for years.

Every dentist present should take the first opportunity of meeting Dr. Heitzman. He is a large-hearted, genial gentleman, very courteous, and, of course, very enthusiastic upon the subject of microscopy. His aim is, he says, to raise the standard of dentists in this country in their strictly scientific attainments, and I am sure he has already done much for the profession in that direction.

His views, although nearly revolutionary in comparison with those held by previous histologists, are not like a sieve —they will hold water—and I defy the greatest unbeliever not to be converted to the bioplasson doctrine after looking at Dr. Heitzmann's specimens through the microscope and listening to one short course of his lectures.

This report cannot close without referring to the great friendship existing between Dr. Heitzmann and our own dear Dr. Atkinson, or "Papa" as Dr. Heitzmann delights to call him. When Carl Heitzmann first came to this country, Dr. Atkinson, becoming convinced of the truth of the bioplasson doctrine, did much to introduce him, and assisted in making the laboratory the success which it soon became; and to the cordial support given by Drs. Atkinson, Mills, Bödecker, Abbott, and a few other prominent dentists, to

Dr. Hetizmann's views, is due his great interest in the profession at large, and his desire to add to our knowledge of the departments of Section 1.—*New England Journal of Dentistry.*

## ARTICLE. V.

### *Asphyxiated by a Tooth.*

BY N. MILLER, L. D. S. I., PRESTON.

The following may not be without interest to many of your readers: A gentleman brought his son (a strong, healthy boy of between ten and eleven years of age) for consultation as to the state of his teeth. Nine of his temporary teeth obstructed the eruption of the permanent ones. This being explained to the father, he wished gas administered and the extraction of what was necessary. The boy, not being the least nervous, inhaled gas freely and became unconscious in from fifteen to twenty seconds; seven of the temporary teeth were extracted, the last being a left lower molar; during the latter stage of the operation the gag slipped and the mouth closed. The patient became partly conscious, assumed a natural color, when he took a deep inspiration, immediately after which he exhibited symptoms of asphyxia, raised his hand to his neck and attempted to tear his garments away, although they were quite loose. Immediately his head was held forward across the knee and some sharp raps given on his back, but it seemed to be of no avail; trial was then made to fell the tooth, but did not succeed. Seeing there was no improvement, a medical man was at once telephoned for, but must have been out, as no answer was received. Then the nearest medical man was sent for, and Dr. Marshall arrived in about seven minutes, who, when he saw the boy, pronounced life to be extinct.

A wish was expressed to the father that he would consent to the doctor performing tracheotomy, which he readily

did. Dr. Marshall made a *post mortem* in the presence of myself and deceased's uncle, when he found the left lower molar, with roots uppermost, firmly fixed in the larynx.

An inquest was held the same evening, when the jury came to the unanimous conclusion that the cause of death was purely accidental. The father being asked if he attached any blame to any one, expressed himself perfectly satisfied with the course that had been pursued during the unhappy occurrence.

Thinking it would be better from a practical point of view if all accidents of an alarming nature were recorded in your valuable journal, for the benefit of those who may not have had such unpleasant experience, I send this account in the hope that it may act as a warning.

I cannot but think that amongst so many as there are in our profession many less serious accidents occur, the particulars of which would be interesting and instructive to all, except, perhaps, the parties immediately concerned, and would show in what proportion accidents happen, each teaching its own lesson.—*British Journal of Dental Science.*

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## ARTICLE VI.

### *The Cause of Death.*

We know, almost for certain, how death takes place in all fatal diseases; *i, e.*, we say, that an individual dies, either by the brain, heart or lungs. In reality, however, we are still ignorant how death is brought about, how the machinery comes to a sudden stand-still, what extinguishes with the last flickering of the final expiration, the vital spark forever. The brain may be extirpated, and animal life has been observed to be still going on: the heart may apparently cease beating, and yet the existence of the being is not finally ended; respiration is to all appearances not filling and emptying the air vessels any more, but still more than vegetation keeps up the complicated machinery, he spark of life still lingers.

What, then, is it that finally causes death? Does it not look very much like the sudden action of a powerful poison, which so thoroughly and at once disintegrates the great circulating, life-giving and life-preserving fluid, the blood, that the nerve centres and their existence, and force the organism to cease every motion, like an engine deprived of its steam?

Experiments that have lately been made, and which we have to thank for the discovery of the *Ptomaineo*, may tend to lead us a step further in the solving of the question before us. A. Gautier has made these ptomaines a special study. It has been demonstrated that many organic substances, the fibrin in the blood, the urine, and certain compounds of tissues, when decomposing, give rise to alkaloids—called ptomaines—which are powerful poisons. This discovery we owe mainly to Selmi. But Gautier has done more. He thought that if such alkaloids are formed on the decomposition of organic substances, why may not, in the course of the common change of tissues, if the latter is deviating from its true course, also such ptomaines be called into existence.

The result of these investigations fully confirmed his theory. A disciple of G. Pouchet succeeded in obtaining from the normal urine a fixed and easily crystallizable alkaloid, the hydrochloric compounds of which crystallize, as well as those with gold chlorid, and platinum chlorid. And this alkaloid has been found to be exceedingly poisonous; in most minute doses it causes stupor, tetanus and death, within the shortest time imaginable, stopping the heart is systole. This very quality relegates this alkaloid of the urine to the ptomaines, for the toxic effect of which the stoppage of the heart in systole is most characteristic. A mixture of ferrum-chlorid, and ferro-cyanide of potassium colors this alkaloid blue, as it does all ptomaines. Gautier was able to isolate from the poison of two poisonous snakes (Trigorrocephalus and Naja) two similar alkaloids.

Gantier proved also the intensely poisonous action of ıe hnman saliva on birds. He evaporated twenty grms. ı the water bath, dried the 0.25 grm., weighing residue, ıd dissolved it in warm water. This solution injected to a small bird, under the skin, caused stupor, dilatation ' the pupil, increased frequency of respiration, and in all ses, death. He was able to isolate an alkaloid also out ' the human saliva. This alkaloid gave the same color action as the other ptomaines.

Another characteristic quality of these ptomaines is, that ey form salts with most of the vegetable alkaloids, as orphia, codeia, atropia, veratria aconitia, hyoscyamia, erin, and others. The ptomaines are very easily oxizable, and may be formed during the normal change of ssues, even without the presence of oxygen.

What may all these investigations, and their astonishing sults, not explain.. If a hypodermic injection of some getable alkaloid accidentally is made into a larger vein, ıd a fatal result the consequence, under all the symptoms hich we used to ascribe to the entrance of air, may not e real cause of death be found, perhaps, in the sudden rmation of these poisonous animal alkaloids? May not any other similar occurrences, which to-day are clouded mystery as yet, find a similar interpretation? May not, the time of the dissolution of the body, a similar process rn on, forever the flame of life? Is it urea, in uræmia, at causes the fatal uræmic symptoms, or does the presce of urea in certain quantities, and under given contions, produce the formation of these highly poisonous imal alkaloids?

The subject is one of great interest to the medical prossion. We mentioned in one of our late numbers, when eaking of the pure keratin pre pared from the eggshell embrane, and its easy transformation into leucin and rosin, the "*multum e parvo*" of nature, and here we ve a still more glaring proof, with what few means nature as with the magic touch of the mystic wand—achieves e greatest results.—*Editorial in Med. and Surg. Reporter.*

# EDITORIAL, ETC.

*The Auspicious Opening of the first Regular Session of the Dental Department of the University of Maryland* on the 2nd day of October 1882, is not only extremely gratifying to all the friends of this new institution, but is unprecedented.

Beginning the lectures, clinics and demonstrations on the first or opening day of the session with *forty students present and matriculated*, the number steadily increased until at the middle of the month of October there were nearly *sixty* matriculants enrolled as dental students in the Dental Department of the University of Maryland, with quite a number yet to come by the 1st of November following. And what is still more gratifying than the mere number of matriculants is the fact that the class of students in attendance is *a very superior one.* A number of them have attended lectures etc., during former sessions in several other dental institutions, while others have been in practice for five eight and ten years; and all, without a single exception, express their satisfaction and pleasure concerning the course of study, clinical advantanges and the many facilities presented by this Dental Department for complete instruction in all the branches of Dental Science.

Another very gratifying fact to both the faculty and students is the rapid growth of the Infirmary and Laboratory practice. Already this practice, on account of the numerous sources at command, has reached such proportions, that the large number of new Operating Chairs are daily filled with patients upon whom the students operate, thereby affording them the actual experience and skill so necessary to the future successful practice of dentistry.

The arrangements and equippments of the new Dental Infirmary and Laboratory Building are so complete as to command the highest commendations from the many visitors. Indeed everything connected with the Dental Department of the University of Maryland is working in the most harmonious and successful manner.

# MONTHLY SUMMARY.

*The use of Tobacco by Boys.*—The use of tobacco by growing
's is so generally recognized as pernicious, that it is extraor-
ary that more energetic measures are not urged upon those
ing the care of the youth to prevent the habit. Already it
been prohitited in the U. S. Naval Academy, at Annapolis,
he U. S. Military Academy, at West Point, in the Phillips
ter Academy, New Hampshire, and in various other enlight-
d educational institutions.

'his was not the result of prejudice or hobbyism. If any set
ien are free from these vices of learning, it is the naval sur-
ns. and it was especially from them, and particularly from
A. L. Gihon, U. S. N., that this attack on the weed began.
indictment laid against it charged :—

That it leads to impaired nutrition of the nerve centres.

That it is a fertile cause of neuralgia, vertigo and indiges-
.

That it irritates the mouth and throat, and thus destroys
purity of the voice.

That, by excitation of the optic nerve, it produces amau-
s and other defects of vision.

That it causes a tremulous hand and an intermittent pulse.

That one of its conspicuous effects is to develop irritability
he heart.

That it retards the cell change on which the development
he adolescent depends.

his is a formidable bill of particulars, and yet each of these
rges is preferred by the best modern authority, and what is
e, each is substantiated by an abundance of clinical evi-
ce

estimony is also adduced from the class records of schools
colleges, which indicate very positively that the effect of
cco on the mental faculties is deteriorating. The best schol-

ars are not tobacco users; non-smokers take the highest rank in every grade; and whether we look at the exceptionally brilliant students, or compare the average of those who use and those who refrain from tobacco, the result shows the same.

With these facts staring us in the face, it becomes the duty of every schoolmaster and every parent to set himself resolutely against the beginning of this injurious indulgence.

It is, indeed, no easy matter to prohibit it successfully. There is a curious attraction about this nauseous plant which has never been explained. A habitual consumer of it cannot explain its fascination. It has extended over the world with marvelous facility.

Nevertheless, we believe that the youth of America are intelligent and ambitious enough, in the aggregate, to be trusted. If the consequences of tobacco using are plainly stated by an authority that a lad respects, it will often lead him to drop the habit, or to refrain from beginning it, when threats and punishments would not. The latter he regards as an exercise of arbitrary power, the former appeals to his reason and good sense. It is the duty of a physician to express himself plainly on this subject, and he can only do so by condemning the habit in boys at any rate.—*Editorial in Medical and Surgical Reporter.*

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*Scurvy and Fresh Meat.*—In commencing upon the report of Dr. W. H. Neale. Medical Officer of the Arctic steamer *Eira*, the *Lancet* says:—

The most interesting of Mr. Neale's observations, however, is that which relates to the absence of any symptoms of scurvy among the men—a fact which has led him to express the opinion that if men live on the flesh of animals indigenous to the country, even without vegetables, they will run very little risk of scurvy, so that, under such circumstances, lime juice is not of much use. Curiously enough, while Mr. Neale is detailing his experience with regard to the prophylactic value of fresh meat against scurvy in the arctic region, Dr. Lucas write to us from India, stating that the meat eating tribes of the northwest provinces are comparatively free from scurvy, while the vegetable-feeding tribes are not unfrequently attacked with the disease. This experience of both arctic and tropical observers, which does not

nd alone, is so entirely distinct from European experience, t some solution of the apparent paradox is required. In a ter which we published some time since, a correspondent nts out that the statements of Mr. Neale and Dr. Lucas need be considered as in any way upseting our established views h regard to the disease, since, as he urges, meat is probably a rbutic and an antiscorbutic article of diet, according to the iod of time that elapses from the time of slaughter to the iod of cooking. Fresh muscle, as is well known, has an alka- e reaction, due to the presence of the neutral sodium phos- te; after rigor mortis has passed off the reaction becomes l, due to the development of lactic acids; the neutral phos- te is thus converted into acid sodium phosphate. In hot ntries the meat is eaten so freshly killed that lactic acid is developed; in arctic regions the cold stops its formation; in opean countries, where meat is usually hung, there is ample e for its generation. Thus in tropical and arctic regions the cle plasma is alkaline when cooked, in European countries l. If, therefore, it be true that scurvy is produced by a inution of the alkalinity of the blood—a view originally put ward by Garrod and subsequently confirmed and extended Dr. Ralfe—then we can conceive how flesh meat may be iscorbutic, while hung meat will have an opposite quality. tly, Mr. Neale is to be thanked for his suggestion of the use lood as an anti-scorbutic. If its employment on future occa- s should further prove its prophylactic value with regard to vy, we shall expect to see it extensively use by our mercan- marine, while under any circumstances, it introduces to the ce of travelers and voyagers a food at once portable, nutri- s, and wholesome.

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*Ether.*—In the *Lancet*, Dr. H. Bendelack Hewetson discusses relative value of ether when prepared with "rectified" or ethylated" spirits of wine. The author state that there is eat difference between them. That prepared with rectified its has been found by those who have used it less safe and desirable, producing more sickness and laryngeal spasm in ain cases in which there is a tendency to such complications.

Of the use and applicability of the methylated ether—as the safest anæsthetic known, when carefully administered by means of Clover's inhaler—he can speak strongly, as the result of daily observation. It is a very ordinary circumstance to occupy eighty seconds in producing complete anæsthesia. without a struggle or a cough, and it is by no means extraordinary for a patient to be "fully under" within the minute. In the case of short operations upon the eyes, and the like, it is hardly ever necessary to re-apply the inhaler after it has been once removed for the operator to commence, the patient remaining sufficiently anæsthetic for an operation such as mentioned to be completed without hurry. Anæsthesia can be prolonged with equal safty even so far as to keep a patient in labor completely under its influence for upward of *four hours* the longest time which has happened in my experience. Methylated ether is, I consider, from this point of view, the safest and cheapest anæsthetic at present in use.—*Medical and Surgical Reporter.*

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*Microscopic Structure of Malleable Metals.*—The following observations on the minute structure of metals which have been hammered into thin leaves are instructive. Notwithstanding the great opacity of metals, says *Manufacturer and Builder*, it is quite possible to procure, by chemical means, metallic leaves sufficiently thin to examine beneath the microscope by transmitted light. Such an examination will show two principal types of structure, one essentially granular and the other fibrous. The granular metals, of which tin may be taken as an example, present the appearance of exceedingly minute grains, each being perfectly isolated from its neighbors by still smaller interspaces. The cohesion of such leaves is very small.

The fibrous metals, on the other hand, such as silver and gold have a very marked structure. Silver especially has the appearance of a mass of fine, elongated fibers, which are matted and interlaced in a manner which very much resembles felt. In gold, this fibrous structure, although present, is far less marked. The influence of extreme pressure upon gold and silver seems to be therefore, to develop a definite internal structure. Gold and silver, in fact, appear to behave in some respects like plastic

ies. When forced to spread out in the direction of least stance their molecules do not move uniformly, but neighbor. molecules, having different velocities, glide over one another, sing a pronounced arrangement of particles in straight lines.

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*o Salivation from Amalgam Filling.*—I have practiced den· y thirty-nine years. I never saw a case of salivation pro. ed by amalgam fillings.

'or the last eight year I have used amalgams constantly, unting to eight hundred amalgam fillings per pear, for the *age* of those eight years. I have mixed the amalgam in palm of my left hand for more than nine-tenths of that. I never had any symptom of the pathological effects of mer- , either local or general. On the contrary, I have had bet- health than for ten years previous, and the color of my face changed from paleness to healthy, ruddy glow, and that, without the help of "beer, wines, or spirits."

ll well read physiologists know that *experiments* have demon- ted that *very* small quantities of mercury increase the num· of *red* blood corpuscles.—*Henry S. Chase, M. D., D. D. S.*

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*ement for Rubber.*—Powdered shellac is softened in ten s its weight of stong water of ammonia, whereby a transpar- mass is obtained, which becomes fluid after keeping some e time without the use of hot water. In three or four weeks mixture is perfectly liquid, and, when applied, it will be d to soften the rubber. As soon as the ammonia evaporates rubber hardens again—it is said quite firmly—and thus mes impervious both to gases and to liquids. For cement- sheet rubber or rubber material in any shape, to metal, glass other smooth surfaces, the cement is highly recommended.

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*rural Neuralgia Among Dentists.*—On June 20th I was called gentleman said to be suffering severely from sciatica. The ent was resting on his right side, complaining of intense in the left loin, radiating thence along the outer and erior aspect of the left thigh whenever he attempted to

move. Firm pressure, applied between the tuberosity of ischium and great trochanter of femur was painless, but the instant one touched the skin immediately over the erector spinæ muscle severe pain was evoked, extending down the thigh to the knee-joint. mapping out exactly the course of the anterior, crural and external cutaneous nerves. Pressure over the points of exit of the second, third and fourth lumbar nerves. from the spinal canal caused excessive pain. The nerves at fault were clearly the second, third and fourth lumbar, the hyperæsthetic area in the loin clearly corresponding to the distribution of the posterior divisions of these nerve trunks. The case was obviously not one of sciatica, but crural neuralgia, having a very unusual distribution; the ordinary forms of this disease extend to the foot and toes of the affected leg. Belladonna and aconite were applied locally, trychnia internally; the patient was convalescent in seven days.

Two days later a similar case came under my notice, and a third has been reported to me with exactly similar symptoms. Curiously enough, the three patients were dentists, engaged in the active duties of their profession. It appears exceedingly probable that this painful affection may be explained by the fact that when dentists operate they always stand at the right side of the patient, consequently, when manipulating cavities in teeth difficult of access it is necessary to throw themselves into a constrained attitude, whereby the lumbar vertebræ are slightly flexed anteriorly, but flexed laterally to a considerable degree. It is necessary, sometimes, to maintain this cramped position for long periods, the temporary distortion being even more exaggerated when the dental engine is being used. These combined flexions cause their lumbar nerves to become congested, irritated and possibly injuriously nipped as they pass through intervertebral foramina. thus giving rise to the symptoms detailed above.—*Dr. J. B. Sutton in London Lancet.*

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## ARTICLE I.

### *Specialties and Their Advantages.*

BY DR. GEO. A. MILLS, BROOKLYN, N. Y.

ead before the American Dental Convention, at Saratoga, Aug. 9th, 1882.]

Mr. President and Gentlemen :—It is not my purpose argue the question regarding the propriety of specializ-g various departments of labor, but to enter at once e arena of history and to state the accumulated eviden-s found in all the departments of divisible work. Nature s set the example throughout the cosmos of creation. ok where you will and the query will arise to the oughtful mind—why is this so arranged? And when e answer is found it invariably acquaints us with the fact at it is arranged to be so for special purposes. Nothing created in vain. All the multitudinous divisions of the imal kingdom into species are so made to promote spe-al ends. Man, who has been placed upon the highest ane, has been endowed with intellectual capacities to rform special work, showing it is a special purpose for ise ends. When this is made clear we shall be satisfied; til then let us wait. The inquiring mind seems to know

no satisfaction; the possibilities being exhausted in any given direction, new zest is applied to researches in fresh and unexplored regions. To our finite comprehension there seems to be no limination to the work which the human mind can find to do. All nations have done work, conscientiously or otherwise, that specialized itself in the history of accumulated civilization. Nations have done, and still continue to do, their governmental work by a system of prescribed laws. All this is working out special ends, and the ultimation will be productive of good results to mankind. Mental activity has had its special representatives in all the known history of the race; the recorded evidence of this fact exists, impressed on the works of nature by unknown hands, and in some instances in unknown tongues, yet to be deciphered by the specialists in the department of languages. We can say, as a general remark, that the numerous departments allied to the interests of mankind are special, and each has, and will continue to have, its special end in view, with a trained hand to conduct the general work. Under this head there will be subdivisions of labor by specialists. In our day we have three divisions of special labor, called professions, that have their historic value; which reveal potencies that exert an influence resulting in beneficient products to the mind and body. These divisions are divinity, medicine, and law. With the proper knowledge and its legitimate application, there lies within this tripod the solution of the problem of the highest development of civilization. The first will lead to mental foresight, the second correct the disordered physical condition, and the third establish us on an abiding foundation of harmonious living. These calling are associated with many departments of collateral research, and there scarcely seems to be an end to the devices of men to solve the hardest of all questions: What is truth, and where shall I find it? Through all ages the needs of mankind have, in due time, presented their demands in accord with development, and out of all these emergencies a de-

iverer has appeared to appease the desire. In the langu-
age of our old and familar proverb, we find the fact that
has always been and always will be true—"Necessity is
the mother of invention." The noblest specimens in
representative labor have had their origin in humble spheres,
from the Man of Nazareth to our own martyred Garfield.

Genius needs the stimulus of necessity. The public
owes much to that necessity which has so often spurred
genius into action. While we see much to admire in the
noble and self-sacrificing life of a genius, yet his greatest
nobility will only be revealed by the pure and white light
of those rarefied atmospheres of his future life within the
realm of unselfishness.

Genius is not uncommonly found in company with spe-
cialized labor; but more often special work is found allied
to motives that are not compatible with the life of a genius.
Perhaps it may be better that a low motive prevail than
that there be none at all. Yet I am sure that in this
unparalleled age of progress, in which we are being sped
on the wings of electricity, whirled at one moment into
seeming impossibilities, and the next, all doubts being dis-
pelled, we can afford to be patient, that out of all these
efforts there shall come success.

What wait we for but the crowning of mankind with
peace and good-will toward men? Yet while we wait it is
not without hope. America is to be the arena in which
this grand problem is to be worked out. For to-day indi-
cates that, were we wanting for material with which to
grapple with the problems of life, we shall have it, for the
representatives of all nations are flocking—"as doves to
their windows"—in almost countless numbers to our shores.
They are bringing something of almost everything, and
with liberty, without license, these commodities are to be
passed through the process of fermentation, out of which
will come the spirit of reconciliation which has been brewed
out of untrammeled intellectual thought and action. Then
to no other land can we look as offering so much encour-

agement to progressive specialized labor. While there is much that should admonish us that whatsoever we sow that we shall surely reap, yet I think much will be accomplished that shall soon soften the harsh grasp of the avaricious, while at the same time increasing intelligence shall stimulate others to greater efforts for a better position for themselves by the practice of a greater frugality. Honest, cheerful labor will, I predict, do much to lessen the desire, so destructive, for artificial living. Wealth is not at all wrong, neither is labor all wrong.

With this prolonged introductory, if it may be so termed, I will now note some of the most prominent results of systematic labor by specialists. In the financial department we have some very noted specimens, such as W. H. Vanderbilt and Jay Gould, who are perhaps the most prominent. They stand before this young country almost as miracles, repeating that dazzling, wonderful story of our youth, the Arabian Nights. I am not one that counts them the worst of sinners. They are doing for this country in a decade a work that it would take centuries for associations of men to do. By the word of mouth they dictate into existence, almost in the twinkling of an eye, a projected artery across a vast expanse of territory heretofore abandoned to the wild beast and the cactus; and ere we are aware of the fact, they are utilizing this ponderous channel by sending to these new territories thousands of pilgrims who come seeking homes in this great land of liberty, of which we sing, there to thrive and become allied, in the coming years, to all that makes us a prosperous and mighty people. These financial giants specialize their great and fabulous wealth by gigantic enterprises. If it were not for such avenues how would these myriads of human beings be distributed upon the countless thousands of unused acres in our land? It would seem, as we look in astonishment upon these determined, bronzed countenances that we see almost daily flowing out of the great railway caravansaries that jut themselves into the very waters

which ebb and flow between us and these unlimited countries of Europe, as it were, scooping them up on our hospitable shore, it would seem, I say, that these men who are projecting so mightily were, with their energy and millions of resources, raised up to do this mighty work of advancing civilization. Cannot we wisely halt in our general habit of criticism, and spare a little, to see what the coming days shall send? Human judgment is so very easily made to prejudge in all matters of public doings that its haste often prevents the best deductions. A question that may well be asked, and which, as you will see, is not foreign to the subject we are considering, is: Can the march of civilization to its destined end traverse the rough and untrodden way of barbarism without disturbing some of the lower conditions of existence?

I might continue on through the varied departments of human labor, and divide and sub-divide from the highest to the lowest, but I will hasten to make the application in the interests of the department to which we are devoted. And, in passing, we will not omit to notice a few who have made themselves prominent in these varied departments, more particularly in our time.

In mercantile life we record the names of A. T. Stewart and H. B. Claflin, both of which find no rivals, and who are classified as merchant princes. Concentrated energy has specialized their conduct, and their methods of trade, wisely arranged, have resulted in munificent rewards.

The profession of literature has, in our time, given us not a few names of distinguished celebrity, among which are the poets Longfellow and Bryant, who have not only sung out to us the language of their own souls, but that of thousands of others. And they rest from their labors, well done.

We call out from the score or more of authors, the names of Irving and Holland, both not soon to be forgotten. Such a philosopher as Emerson has left the general impress of his daily notes, which were gently wafted into his fertile mind by day and by night, and the coming time will record

their value, and pay tribute to his memory in the utility of his richly garnered pearls. Also the names of Webster and Evarts will long illuminate the roadway of the law; and the day will be very far from this when the power of that mighty intellect enshrined in the form of Horace Greeley, and inspired by an honest heart, shall drop out of memory or cease to inspire the press to high attainments. His example shall be even more lasting than any monument that men can erect.

To speak of the long list of names that have marshaled the dogmas of theology, and select a trio as shining examples, would doubtless put me in the attitude of a sectarian, for the divisions are so numerous, and favoritism runs to such extremes, that it is not an easy task. And yet it is true that such men as Beecher, Chapin and Bellows, have, in our time, wielded a mighty power for the good of their fellows, that will be lasting in human experience, animating thousands in their daily work, and aiding and advancing Christian civilization. They have cast fruitful seeds into much broken and mellow soil, which must spring up and bear fruit to the honor of the race.

Among the centuries a host of names have been emblazoned on the pinnacles of fame from the division of labor classed as healing art. If we garner from out of those that are truly representative of our new and growing country, I find myself, as in the last situation, with a difficult task in hand, for I am reminded of the *pathies* and *no-pathies*, the specialist and the generalist. To speak of the generalist would seem to be apart from the direct purpose of my paper, but that I may harmonize, I shall hold that he can only excel by specializing for general purposes; and I shall not expose myself to much, if any, criticism, when I say that few are endowed, in any large sense, with capabilities that will or can mature a generalist. Such as a Mott, and a few of his stamp, are safe to memorialize, but, in the division of the many departments, we find active in this day the name of Joel Parker, and Pancoast and

Warren, who are distinguished quite above the average in the specialty of surgery, which is, as you are well aware, a youthful branch, as compared with the age of general medicine. Sims and Thomas have made the field of the gynecologist one of mercy and relief to that class of sufferers so common, and we, who have no knowledge (by experience) of them, can well give thanks for their contribution in the alleviation of such peculiar trials. Agnew and Knapp doubtless have gained a reputation as oculists and aurists, which is freely accorded to them as ranking as high as any, if not the highest, among their fellows.

The time will not allow, without weariness, to fill out to completeness the names of the numerous representatives of other specialized departments, and only to speak, in passing, of the neurologists, associated with the names of Brown-Sequard, Seguin, Beard and Hammond; the orthopedists, Taylor, Sayres and others, and lastly, I will refer to him who, as yet, may not be crowned by the general fellowship of his calling, but who is destined to be accorded a position as a specialist in the department of histological research of the animal tissues, second to none in this country, or, I predict, in any country, Carl Heitzmann. Yet but thirty-six years of age, a native of Hungary, schooled in medicine in his native land, becoming associated in Berlin, Germany, as a draughtsman with parties employed in the department of governmental work in the scientific field of research, he was, by a coincidence which we would often denominate providential, by the death of the head of this department, called to supply the vacant place at a salary amounting, in our money, to about ten thousand dollars. Coming to be cognizant of the work of the several specialists employed in this field, he discovered that in the acceptance of the protoplasmic theory all had settled down upon the decision that this body of material was a structureless one. The thought struck him: is that a consistent view to accept? It was an inspiration to him to try and prove the untruth of such a meaningless

and vague idea. As he said, "When I took up the study of protoplasm in 1872, I had before me a blank book." But to-day he has his reward in the acknowledgment of the ablest microscopists of the world. Seven years circumstances favored his coming to this country, with hope of greater liberty in the pursuit of his work. Although commencing his labors in a quiet and unpretentious manner, his field of labor has steadily been on the increase, so that now his laboratory in New York City is a place of great resort by those engaged in histological research.

To this famous student and a few co-laborers from out of our ranks, (for which great credit is due to Dr. W. H. Atkinson, who introduced him to the notice of our calling) we owe much; and, gentlemen, the pages of our literature are now bearing testimony to the fruits of these labors, and we are able to say that in no branch of scientific research associated with the healing art are the histological and morphological portions of the human anatomy better understood than that of the human teeth and their connected tissues. The confirmed knowledge of the minute anatomy of these tissues has come into our possession in less than a half decade, by the energies of Carl Heitzmann and his eminent co-laborer, Dr. C. W. Boedecker, of New York City, a member of our calling whom we delight to honor. This feature of my remarks brings me to the part of my paper that will be of special interest to us. We are well aware of the attitude of this our department of dentistry at the time of its conception. Generated in lonely surroundings and nurtured on a low diet until it was evoluted into a more ambitious stage of existence, and going on until it reached the times of such a benevolent spirit as Chapin A. Harris, who caught the inspiration to provide a more befitting atmosphere for its future life. And we may well do honor to such a man, that with so little he did so well. By special energy and concentrated labor with wise associates, our department for the allevi- of human suffering was first cradled in the city of Balti-

nore, by the institution of the Baltimore Dental College, ınder a charter given in Maryland in 1839. And the ılumni of this college embraces in its list not a small numer who have occupied positions of prominence both in his country and in foreign countries. From this special endeavor a nucleus of energy was created, which has been lisseminating its influence gradually and certainly, so that o-day we number in all fourteen institutions. All this is he result of honest, earnest and special effort. The progress made in our calling has not been surpassed in any ther during the last twenty-five years. Doubtless the eature of associated effort has given a direct impulse by leveloping the latent forces acted upon so advantageously y the fraternal atmosphere of association. This body has ad a signal influence upon this work. It commenced the abor of bringing (in large bodies) out of chaos into conert of action, from which advancing thought has grown o a more defined method of labor. Although it may be hought by some that it has outlived its mission, yet it does ot follow that if there be a feeling of devotion to the nstitutions of a more democratic method of governmental ction, it need be discontinued; it is certainly not hurtful, ut cannot be anything but helpful, for the fraternal influces alone will develop a bond of union that is not without s expression for usefulness. We have not outlived yet our ission towards the unorganized mass of practitioners. I eclare myself here and everywhere an integral part of the epartment of the whole healing art, and on the side of elpfulness to any and all that I can assist. The day has ot yet come to draw the lines too strictly, and it would e more becoming, I think, for some who figure so dilihently as law-makers to be a little modest It is better, nd I think it is profitable, that occasionly we look back o the pit from which we were digged. I am not by any neans opposed to any and all work of our several societies who have in mind sincerely the elevation of our profession. But I do think that the transactions of some of these

societies are fostering more of a spirit of arbitrary seclusion, fostered under the guise of pretension, that, if continued, will give rise to the suspicion that the best interests of the profession will not be attained; for instance, the creation of a degree by the New York State Society, and this degree put side to side with those given by institutions chartered by the various States, and one particularly in this State. It is a lack of good judgment, certainly, and if it is continued will be a shame and disgrace. No high-minded man with a little reflection can but see the shallowness of such a degree as this M. D. S. issued by a State organization. What would common sense say of such a procedure applied to law and divinity, or to medicine generally? It would stamp it a sham. This may be thought a little general in its application, yet I answer no; it is a work of special labor to see that it does not long deface the creditable advancement of our calling. It behooves every thoughtful man to give emphasized expression until its work of misguiding shall come to an end. Does any one think I am a lonely voice to speak against this thing? Nay, nay, I know whereof I affirm. More, I know the thought, in no small degree, of the representative portion of the profession regarding this, but it will take a little courage to throttle this mistake. It has unfortunately, and, I believe, unthinkingly, been attached to the signatures of not a few worthy men, and this fact makes it all the more serious in its results, and this very class of men should see to it that they do not countenance a work that stands so utterly in opposition to all that is progressive. For bodies of men to form themselves into exclusive alliances, shutting out such as do not chance to hold any degree, seemingly giving out the idea that attainments only can be found behind a degree, is very weak indeed. I honor all degrees creditably secured, but I say that in these days of such rapid advancement in the acquisition of real scientific knowledge, these distinctions based on such puerile pretensions are certainly not becoming any body of men who are

ruthfully desiring the elevation of their calling. I assume he liberty of this digression, knowing that I am before a emocratic body; yet I shall claim that what I have said as an immediate bearing upon what I propose to say furher in this paper.

You have doubtless noticed, as I have, the fact that few ıen are endowed with capabilities sufficiently fertile to nable them to excel in any large sense as generalists. Ve are not unfrequently reminded by this fact of the easonableness of a greater division of labor, and to some xtent it has been effectually put into preatical use. And his evidences the importance of urging the value of more umerous subdivisions, with the hope that more fruitful esults will follow; and I think all of us should seek to do l we can to mould the future character of our calling in is direction, and aim by word and deed, in concerted tion and in our general intercourse, to so mature the urposes of such action that it shall be instilled into the inds of those who shall choose our vocation. These ould be impressed to follow the branch of labor for which ey are best fitted. For instance, one has a particular ste and fitness for fitting teeth, another is possessed of atient ingenuity, adapting him to occupy the field of corction of oral deformities, for which mechanical appliances e requisite. This may or may not embrace the portion service allied to the construction of artificial teeth, yet y theory is that the field is so fertile, and so much in need a higher grade of culture, that it could wisely and ofitably be made to become more beneficial in its results. nd I would say the same in connection with the more ominent features of surgical services. All these divisions quire, yea, they demand (that they may result in the eater good) the most liberal assistance of all the scientific lies that will aid in the largest acquirement of skill. nd here I propose to make particular mention of some ho have, in no small degree, acquired merit, and have ceived a reward that compensated somewhat for their

efforts, accompanied with many difficulties which will not as much distress those who may ally themselves to these special departments hereafter.

How little we realize the cost of foundation work, and how little we understand, in any large sense, or appreciate the motives of those inspired to do this preparatory work.

No man has been more intimately identified with the special life labor of infusing a spirit of progression into our calling than Dr. W. H. Atkinson, of New York. He has been a Prophet, Priest, and King. As you all know, with an endowment which has shown remarkable evidence of unlimited resources, he has been an Elijah to us, fearing no obstacle of opposition. Some of you will remember his first advent before this body at a meeting in New Haven. He then came among us like an apparition, unshorn and unshaven, and was then termed the crazy Atkinson, the wild man of the West, etc. Now if you can cast a view from that day until now, you can behold what he has wrought. Any that have been at all cognizant of professional workings until this time can readily see his imprint on all that has marked the way of progress. By this I do not mean to infer that nothing has been done but by him but that he has been largely the inspiration of most of that which has infused a spirit of enthusiastic zeal, is certainly true. Wherever the interest of this profession exhibits itself there his name is known and honored. Truly his reputation is not alone national, but world-wide. May his last days with us be his best.

We cannot fail to notice so valuable a contributor to the advancing status of our service as Dr. Garretson, of Philadelphia, who has labored so assiduously to raise the standard of special surgical skill to a position that is second to no other department of the healing art. It is doubtless true that he has no pear as an oral surgeon, and we can only be proud of such an accession. The establishment of the Hospital of Oral Surgery, in connection with the Philadelphia Dental College, is certainly one of the most signa

steps in advance that has been made in connection with practical instruction, and offers advantages that should tempt cultured men to this special field of service, for I know of none that holds out more flattering opportunities for large success. It is truly gratifying that the indication of the demand for advance in this work is being vividly impressed on the profession.

Another feature of practice has fallen signally low, and done much to dim the earlier lustre that had been doubtless truly accorded to the branch that has been termed mechanical dentistry. But to-day it is rallying for a better expression, I predict, under a new and doubtless more befitting term, prosthetic dentistry. I do not mean to detail the decline of this department; I had much rather hasten to signal the prospect of a higher grade of practice. The desponding position of this department has commenced to yield its results, and is already indicating that we are nearing a grade of practice associated with higher attainments. Yet these hopeful signs are not the results of sudden chance. Thanks to the nobility of untiring genius that has not bowed the knee to Baal, but through years of patient toil, encountered by many sad and heartsore disappointments, cast down but not defeated, stern necessity has stimulated to higher purposes, and year by year diligently pursuing, and learning to labor and to wait until the reward of honest purposes should appear.

Gentlemen, to whom do we owe a debt of gratitude in this direction more than to any other man? To our worthy and world-honored brother and co-laborer who sits with us to-day, Dr. John Allen. My dear sir, you have fought this warfare; you have never faltered even in the hour of seeming defeat; when many would have been discouraged you rallied your little all of efforts—and they were little of this world's goods—with a faith that looked over and beyond, to a future that should reveal a more hopeful time. My dear brother, in your fast declining years, though indicating that physical infirmities are fastening themselves upon you,

and you are reminded that what you do must be done quickly, you will soon rest from your labors. But most assuredly your works will remain; and those of us who may survive you will sincerely accord to your memory honor and praise for the noble and self-sacrificing work you have accomplished. And it is a comfort to know that, although we commit our works to other hands, that which is of value will remain. We are so constituted that we do derive satisfaction in the rewards coming to us in this world for meritorious services, and you have not been overlooked in this respect. You have, certainly, in those richly ornamented gifts presented to you by all the national and international exhibitions, the world's evidence that the attainment of skill has been of a grade much above the ordinary; and we can but hope that they will find some secure place of deposit that will be, in the near future, provided by the munificence of some one or more of our calling; for certainly they can but be estimated, in no small sense, as an incentive to those who will follow us.

I have noticed that there has recently been published and distributed, by authority of our Congress, the official reports of the United States Commissioners of the Paris Exhibition in 1878, and among other things mentioned it says. under the head of American Dentistry: "The exhibits in this department were adjudged far above all others, and the award of the grand prize medal was accorded to Dr. John Allen & Son, of New York City." Certainly we can truthfully congratulate you and rejoice with you; and we also are able to deduce from all this, tangible testimony of the advantages resulting from special service. There is already enough evidenced in what I have said to inspire the purposes of all, and also to create an incentive that will impress upon us the importance of greater exertion in the department of special *surgical* labor.

I have alluded to the signal evidence of a decided upward advance in the department of prosthetic dentistry, and it may be well to notice in what direction it is. In the first place, by a greater desire shown to conserve the natural features of the face by a decrease in the practice of so ruthlessly removing useful teeth by extraction; second, in the marked increase of retaining the roots of teeth from which the crowns have failed;

third, a return in a larger percentage to crown setting upon these roots, associated with improved facilities which give greater assurance for their more uniform comfort and durability. We can but notice with what enthusiasm special effort is working in this direction, and helping in no small sense to answer that question, which has an important bearing upon the work we have in hand: How shall we meet the masses at a price they are able to pay? For, view this as we may, the poor and the penurious we have with us always. Probably the two most prominent improvements, and the two that will become the most universal because of their greater simplicity and inexpensiveness, are the Richmond and the Bonwill crowns. Their introduction has proved their supposed value, in a very large sense, by their popularity in so short a time. The Bonwill crown will doubtless find a more ready application in practice at the outset. Both of these methods have objections raised against them. The Bonwill is the least expensive, considering its first cost, yet I think they are far more liable to require frequent repairs. I think in the Richmond method, and in connection with it, there has been devised an improvement that should attract our attention.

I have not yet, only in a general way, alluded to artificial teeth inserted on plates coming in contact with the mouth, Though there will be cases, from the necessity of which we can as yet see no escape, yet we know, all of us, the disagreeable conditions produced by the contact of any and all kinds of materials with the mucous membrane of the mouth; vastly more so with all non-conducting substances, such as rubber and celluloid. These plates not only pollute the health of the mouth in no small degree, but they entail other difficulties which are unlimited. I refer to the changes that take place in the tissues, both soft and hard. These changes are produced by absorption, and bring about untold complications and discomforts, associated with frightful contortions of the features of the face, carrying distortion of expression to such an extreme that it is a common remark among all close observers. How many, there are that exhibit a prematurely old face? Is there anything that the mass of human beings will hail so joyously as an escape from these direful consequences?

Now, there may be evils associated with all these methods, but the thing we most desire to do is to make choice of that which entails the least of them. Now, from what I have seen in quite a large number of practical cases, I am able to say that, in my honest judgment, there has never come to us such a boon of relief to offer to the world at large, as the method of attaching artificial teeth combined with the Richmond Crown. I do not consider that the objections urged against the plan of placing the gold band attached to the crowns under the gum at the neck of the root, are weighty enough to militate against the priceless advantages gained over other methods. This kind of work, you will understand, I am advocating in such cases as it is applicable, where, for instance, the intervening teeth are absent and intervening roots are present, so that by the application of the crown on the several roots, the spaces requiring teeth where there are no roots can be combined by a process of bridging. I am well aware that this endorsement (which is of my own free will) will be thought a somewhat singular procedure by some (considering my standing in the profession) because of the plan adopted by Messrs. Sheffield & Richmond to make this invention known in such a public manner as they have done, by a large expenditure of money through the columns of the leading newspapers of the country. But I am reminded again that I am in the presence of a body that has no prescribed laws indicating the methods of conducting a practice. Gentlemen, I am openingly and avowedly opposed to any and all codes of ethics, and have always advocated against them, so this cannot be ascribed tc me as any new impulse. I see more clearly than ever the absurdity of such prescription; and I assert, *knowingly*, that the hearts of the profession are in spirit absolutely against the continuance of these laws. And I predict that the time is near when the current will be changed, and in my estimation it will do more to adjust the discriminations than anything else we can do. Allow me to ask, what moral right have any body of men to legislate against any man making known to the whole human race, if he desires to do so, that he has (or believes he has) a special service at his command. It is a singular fact that the Healing Art is almost, if not quite, the only calling that holds to such a relic, if it be one of

heathenism. You will notice? that the new organization that has come into existence, and which calls itself, inspirit ,the National and International body, have purposely, and in view of the progress of the age, kept it out of their constitution, and they have acted wisely, for men whose chief desire is scientific attainment have no taste or desire to quarrel with their co-workers on methods, but their first and only thought is knowledge. The quicker all proscriptions are removed, the sooner the public will arrive at a wiser discrimination in their choice. I state knowingly that the honest convictions of our best men are in sympathy with my expressed thought. Many are on record in accord with these views, and many more entertain them, as yet quietly, and I predict that the time is not far off when we will see them put into practice. Special labor in this field will bring its advantages in this direction.

The subject of pericementitis, with the Riggs' feature included, which means, in a practical sense, a specific disease of the membrane of the socket, and manifested in a variety of ways, more or less familar to many, viz., accumulations of lime with their admixtures; so-called tartar; inflammation of the gums, causing them to bleed by the slightest pressure, being very tender without apparent cause, often very loose; marked destruction of the gums and falling away, frequently an exterior exudation of pus, associated with a sickly, fetid oder in the breath, more noticed by others that by the person in trouble; and, in not a few cases, a general disarrangement of the bodily functions, expressed by great lack of energy, low spirits, loss of appetite; and with this exhausting condition of health the patients are wholly unconscious that it is attributable to this disorder in the mouth, while they are constantly appealing to their physician for relief, and to no effect. I am impressed that these facts must be brought to the minds of medical men. To commence such a labor I prepared and read, by invitation, a paper, in May last, before the Kings County Medical Society, in Brooklyn; subject, "Pericementitis, its Manifestations in the Oral Cavity, and its Serious Effects upon the General Health." This has been published in their monthy journal, and I have had a reprint of a thousand copies for general distribution, which will be sent by mail to any who desire them.

The physician has it in his power to contribute much assistance in the line of relief that calls so loudly for help. In my judgment more encouragement will come from medical gentlemen, for the reason that they will more readily detect the peculiarities of this insiduous disorders because they are cultured in surgical perceptions. Experience assures me that specialized energy will bring the results sought, sooner or later, in this direction.

The institutions for teaching, in our calling, are becoming conscious of the demands pressing upon them for additional efforts, and they *must* be prepared to meet them, or they will see opportunities springing up about them that will entice those seeking our calling through educated channels. One thing is sure, they must keep an energetic thought in action, ready to cultivate the field that signalizes the certain tendency to special teachings for special purposes. So far, all of the teachers have fallen short of the duty they owe to the student and the people, by their neglect to teach the knowledge attainable in connection with the special disease I am emphasizing the importance of. The time will come when the schools of dental teaching will be compelled to give more than a passing notice to a subject which is of such vital importance to the people. What do the students that are passing out of our several colleges by scores from year to year, know of this cyclone of destruction that is so insiduously entailing untold distress upon the mass of human beings? Is there any evidence that is worthy of record that is manifested in the infirmaries of these institutions? I answer most emphatically, no; and there will be none until the subject is brought before the classes by some one who has some knowledge to speak with, and something that shall *inspire* the young men who are looking for just such opportunities as such a field of service offers, second to none other in the whole range of professional science. Such apathy as I see manifested by men of no small attainments in other departments, is quite incomprehensible, with the view I take of the duties of one, who assumes the responsibilities of a teacher. So far as I have been able, I have had one steadily growing purpose during my whole professional life, to make such use of opportunities that I might be fitted to dispense helpful service in a degree above

the ordinary. How far I have succeed I leave for future decision. Fortunately, I came into the calling impressed from the first with a love for it, and now, in my twenty-eighth year of practice, my affection does not wax cold, nor have I ever seen a moment when I could wish I had chosen any other avocation. In this I have escaped the direful lamentations that have so often come to me in my associations: "I wish I had never heard of dentistry," "a dentist has no honor," etc. etc. Such members of the profession have been only barnacles upon it, and have done much to retard and hinder the advancement of those who desire to make it an honorable calling. Those men are found clamoring for the elevation of the profession by loud and frequent lip-service and a very meagre attainment of ability to serve the people with a service based on real intelligence.

I am well aware that my enthusiasm has made me aggressive in advocating my views, and I have learned that all progress is of its nature, so. Fortunately for my growth, intellectually and practically (at least) I have allied myself in my most intimate associations, with those who were my superiors, and, as I look over the last twenty-one years, I must say that if I could not see tangible evidences of a rich development I would then be compelled to admit that I have been a dull student. And all this enables me to bring to bear upon this specialty I have espoused, a degree of zeal and understanding that the nature and circumstances of such a subject require. With this, as with all other departments that I have made special efforts to excel in, I have found the appreciation and reward slow in coming. Whatever course my future will determine, one thing I shall do, I shall strive and aim to pursue a course that shall contribute the greatest good to the largest number possible. I know, in the ability I have acquired in the treatment of the disease that is causing the destruction of so much health, and the loss of so many teeth ultimately. I say I know, by a demonstrated practice, that I have it in my power to render a vast amount of service to my fellows; and the problem is, how to reach the people and impress them with the fact that there is a *balm* for their sufferings. How this can be *best* brought about I am not fully prepared to answer, And yet, if

I should see my way clear in the future, by casting aside all supposed professional restraints, that I may bring about a more speedy accomplishment of my purpose, I shall not shrink from it, and I give my assurance that I will strive to prove that a live professional man is one that makes his efforts concentrate toward the accumulation of such knowledge as will lift the burden of physical affliction, that hangs so like a pall over humanity; and this regardless of all the protests of a so-called code of ethics whose purposes were conceived in an antediluvian age, and have no mission in this day, I have noticed, to my sorrow, that the ones that clamor so loudly for such relics of barbarism are, by their acts, the most frequent violators of them, not so much by the use of printer's ink, as by ungentlemanly deportment, the use of unbecoming language, and their immoralities. Now, all I ask is to be judged on the basis of virtue; and may I so conduct my life that it shall write out the *unwritten* code of ethics, which shall be as pure gold refined in the crucible of human experience. For an affection for my profession I yield the palm to no one; I have, by specialized labor, daily sought its advancement in all that pertains to its upbuilding on a moral and intellectual foundation, and this I shall continue to do until I am called from my present activities into those of greater promise.

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## ARTICLE II.

### *Histology of the Nerves; a Contribution of the Latest Researches.*—(CONTINUED).

By attentive observation one sees in the centre of Schwann's sheath a band, cylindrical in form, and refracting light less powerful than the myelin (which has just exuded); this cylindrical band is seen to extend a certain distance beyond the cut end of Schwann's sheath, and at that point is so pale and transparent as to be distinguished with difficulty.

This is the *axis-cylinder*, first discovered and described by Remark.*

* Freriep's "Neue Notizen." No. 47, 1837.

Thus we see a myelic nerve-tube is composed of the sheath of Schwann, the myelin and the axis-cylinder.

On changing the field one reaches a portion of the nerve-tube which has undergone no change in the relation of its structure. The double contour, due to the intact myelin, is seen. Tracing the tube further one encounters interruptions in the myelin, at more or less regular distances, in the form of traverse partitions, called *annular constrictions.* At the centre of the space between two constrictions the nerve-tube presents a nucleus, lying within a niche in the myelin and surrounded by a layer of protoplasm. As Sigmund Mayer * has pointed out, this protoplasm is not only granular but pigmented in the frog. In mammals it is simply granular, and but one nucleus is found in each inter-annular segment.

A properly-prepared nerve-tube should show the following details: At the annular constriction the nerve-tube terminates by a slight enlargement. This is due to a larger collection of myelin at that point than is found throughout the shaft of the *interannular segment.* This collection of myelin is contained within a pocket, so as to speak, formed by Schwann's sheath, thereby giving the former a convexity which rests within the concavity of the latter.

Between two of these convex enlargements—forming the extremity of two interannular segments, respectively —placed face to face, a biconcave meniscus is formed which, at first, appears perfectly transparent.

Attentive examination should discover the axis-cylinder traversing this space. The axis is crossed by a stria at the centre of the meniscus, or biconcave space, appearing the more brilliant as the objective-lens is raised from the slide.

At the extreme border of each convex enlargement of the myelin the concave fold or pocket of Schwann's sheath is seen.

* "Die Peripherische Nervenzelle und das Sympathische Nervensystem;" Archiv. f. Psychiatrie, 1876, p. 361.

A delicate nerve segment, treated by silver nitrate, shows the endothelial layer of Henle's sheath. Between the polygonal markings one sees, within this mass of nerve-tubes, a series of small Latin crosses, colored black. The longitudinal black bar is the axis-cylinder stained by the silver nitrate, whilst the transverse line corresponds to the annular constriction.

Attentive examination demonstrates, especially if the myelin have been rendered transparent by the action of glycerine, the alternating brown and black transverse striæ of the axis-cylinder, called *Frommann's lines*, after him who first described* them. These striæ are less marked, till final disappearance, the further from the constriction one examines.

Another silver nitrate preparation shows: Within the continuity of the annular segment, separated from the annular constriction, an enlargement which seems to be soldered to the axis-cylinder. It appears like two cones united base to base, through the axis of which the axis-cylinder passes. The surface formed by the union of the two cones is flattened. This body is called the *biconical enlargement*, is colored black, and on either of which is a somewhat clearer line, beyond which are seen Frommann's lines. In the normal condition of the nerve tube, this biconical enlargement corresponds in position to the annular constriction. In some preparations it is displaced, the axis-cylinder having become retracted within the nerve-tube. The fact that Frommann's lines diminish in size and clearness from the constriction as a centre when the condition of the nerve-tube is normal, whilst in some preparations the biconical enlargement is the centre, leads to the conclusion given above as to the normal position of the biconical enlargement.

In this same silver nitrate preparation a black ring is seen at the annular constriction. The existence of this

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* "Zur Silberfærbung der Axencylinder;" Virchow's Archiv,, 1864 b. xxxi, p. 151.

black ring indicates, since axis-cylinder and biconical enlargement are displaced: first, that it is the sheath of Schwann which is thus colored at that point; second, the soldering together of two separate surfaces of that sheath, since it is known that whenever cellular elements (endothelial, epithelial, connective-tissue cells) are cemented together, treatment by silver nitrate demonstrates such union by black lines; third, that Schwann's sheath is formed of distinct segments, soldered together at each annular constriction. Evidently, therefore, the biconical enlargement is not solidly united to Schwann's sheath, otherwise the displacement thereof with the axis-cylinder could not occur. Regarding the incomplete constrictions described by various histologists, I have never observed them in well-prepared specimens (in physiological extension, fixed by acid osmic, and disassociated with care), and believe them to be due to imperfect preparation.

If a nerve be hardened with acid osmic, and disassociation carelessly and with violence, fractures of the myelin often occur. At the point of fracture it is easy to recognize the axis-cylinder, denuded of myelin, in the centre of the tube, and to distinguish at the edges the double contour of Schwann's sheath.

In a nerve-tube which has been freshly removed from the body and properly prepared, one can see, if the sheath of Schwann remain intact, oblique niches or fissures in the myelin of each interannular segment, called the *incisures of Schmidt.** They are found at irregular intervals. The *cylindro conical* limbs of myelin which they separate cover one another like slate-tiles upon the roof of a house. These limbs terminate by very acute angles, on the one hand, at the internal surface of Schwann's sheath, and, on the other, at the surface of the axis-cylinder, over which they form, for a certain distance, a very slender sheath, as

* Schmidt, "On the Construction of the Dark or Double-Bordered Nerve Fibre;" in the *Monthly Microscopical Journal*, May, 1874, p. 200, first drew attention to these niches.

it were. The segments of myelin limited by the incisures are of variable length, and their extremities assume three forms: 1. One being conical, the other hollowed out as a conical cavity, for the reception of the cone of another segment. 2. Both ends conical. 3. Both ends conically concave. These are called, *cylindro-conical segments*. Sometimes incomplete incisures, *i. e.* those which do not extend to the axis-cylinder, are observed.

The relation of the interannular nucleus to these incisures, and the limbs which they separate, is not constant, being sometimes situated upon the cylindro-conical segment, at others, over an incisure.

In nerves disassociated in acid-osmic and properly prepared with picro-carmine, a certain number of axes-cylinder become disengaged from their myelinic and Schwann's sheath, and float away, perfectly isolated. They are rose-tinted, sometimes possess a deeper tint. Attentive examination would demonstrate that they possess a very delicate *untinted* border, whilst their median portion, colored red, presents an obliquely-decussating striation.

Properly-prepared transverse sections of a nerve show: 1. That many axes-cylinder have changed from the cylindrical to a stellate form, due to an alteration in the myelin (which has formed *boules*, and compress the axes-cylinder) produced by the acid osmic solution. 2. That some axes-cylinder preserve their normal circular form, colored red. Between the rose-tinted axis-cylinder and its myelinic sheath a clear, uncolored ring is seen surrounding the axis-cylinder. This uncolored ring corresponds to a sheath, first described by Maunther,* and named after him *Maunther's sheath.*

All the special histological characters of myelinic nerve-tubes which have just been described may be observed in a *living* nerve-tube, without the aid of any reagent. A

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* "Beitræge zur Kennt. der Morpholog. Elemente des Nervensystems:" Academy of Science of Vienna, Vol. xxxix.

preparation of living frog's lung, according to Holmgren's method, demonstrates that a myelinic nerve-tube:

1. Possesses a *double contour*. This enunciation is just contrary to that of classical authors, who have claimed that the double contour was due to a coagulation of the myelin after section or death.

2. Possesses the same morphological divisions as have been described above.

*Morphological Considerations.*—We have seen that Schwann's sheath is not continuous, but forms segments which are soldered to each other.

We also know that the myelin is interrupted at the annular constrictions, where it is held by the pockets formed by Schwann's sheath.

But the axis-cylinder *is continuous* throughout the length of the nerve-tube; presents no interruption from one end to the other. The proof hereof is found in the fact:

1. That non-myelinic nerve-tubes exist which each possess an axis-cylinder, and in which, by the aid of such reagents as have already been employed for myelinic nerve-tubes, nothing comparable to annular constrictions can be found; there are no distinct segments.

2. That myelinic nerve-tubes which have been deprived of their medulla (reduced to their Schwann's sheath and axis-cylinder) show no traces of segmentation.

3. That the treatment of myelinic nerve-fibres with a solution of caustic potassa (40 : 60) demonstrates there is no soldering of the axis-cylinder.

Each interannular segment may morphologically be compared to an adipose cell, the Schwann's sheath corresponding to the cell membrane, the interannular nucleus to the cell nucleus (each being surrounded by a protoplasmic layer), and the myelin to the fatty matter of the cell.

The axis-cylinder is not a component of a single interannular segment, but is a *distinct entity* within the nerve-tube.

The protoplasmic layer is not limited to the vicinity of the interannular nucleus, but, throughout each segment,

lines Schwann's sheath; at the extremity of the latter it reflected upon the axis-cylinder, which it surrounds. A the point of reflection the protoplasmic layer of one se ment is set back to back with that of the neighbori segment, whence is formed the *biconical enlargement.* would fain believe that these two layers, which are set ba to back, are united by a cementing substance similar that found between certain cells devoid of membrane, f example, between the cardiac muscular cells.

The incisures of Schmidt arise from the development the myelin in several cylindro-conical segments, whereb prolongations from the superficial to the deep protoplasm layers are preserved instead of forming a single mass myelin within each interannular segment.

*Blood Vessels and Lymphatics.*—Properly injected an prepared specimens demonstrate the existence of arteri and veins within tho *perifascicular* sheath, and of small arteries and veins and capillaries within the *intrafascicula* sheath. In the former the blood vessels form a networ with long longitudinal meshes, which appears similar that found in muscles, and possessing, like the latter, great elongated meshes, and their longitudinal primary branche are regularly intersected by transverse or oblique branche The *laminated sheath* possesses no other vessels than thos penetrating it on their way to the intrafascicular sheat Within the latter, and beneath a network of larger bloo vessels (such as just described for the perifascicular sheat only smaller), a capillary network, with elongated meshe may be seen. These capillaries terminate by loops. Fro the summit of the convexity of each loop shoots a capillar which, further on, forms another loop, and soon indefinitel At other points the offshooting capillary takes its origin the summit of the loop which has been formed by the ve sel taking a return course and forming its loop in a inverse direction. Again, a branch may pursue its cour a certain distance, anastomosing with any other vessel, an rejoin the capillary from which it took its origin. Th

arrangement in forked series is very characteristic, and the *tout ensemble* may be called the *chain-like* capillary system.

The structure of the capillaries of nerves is the same as of capillaries in general.

The arteries and veins of the intrafascicular sheath are separated from the nerve-tubes by the lamina of this sheath. The capillaries are only separated from the nerve-tubes by the intrafascicular tissue proper (adults). In young animals their walls are, here and there, in direct contact with Schwann's sheath.

*The Nutritive Plasma.*—Each nerve-tube is constantly bathed in a nutritive plasma, yielded by the blood vessels which surround it, and is contained in the interstitial space formed by the laminated sheath on the one hand, and, on the other, by the nerve-tubes (surrounded by their Schwann's sheath, blood vessels and connective-tissue.)

This nutritive plasma gains the axis-cylinder principally through the interannular constrictions, since the myelin does not allow the easy penetration of liquids.

The interannular constrictions are, then, the celloid channels through which nutritive materials are conveyed to the axis cylinder.

*Role of the Different Parts.*—Schwann's sheath evidently serves to protect and maintain the myelin in place.

The myelin plays the part of protector to the axis cylinder, preserving it from compression. In all probability it acts as an insulator to the latter.

The annular constrictions act the physiological *role* of preventing the displacements of the myelin, which otherwise would certainly occur when placed vertically.

As we have already seen, they are the channels through which nutrition is supplied to the axis-cylinder.

The incisures of Schmidt are undoubtedly concerned in preventing displacement of the myelin.

The axis-cylinder is the medium through which the nervous influence is conducted.

*Sympathetic Nerves, or Remak's Fibres.*—Rema announced, in 1838, that he had found fibres in the sy pathetic nervous system which should be considered nerve-fibres devoid of myelin.

To day histologists, with scarcely any exceptions, convinced of the existence of such fibres.

Remak's fibres are particularly found in great abundan in the nerves of the system of organic life, but they do n however, exclusively or specially belong to that system.

They are found in all mixed nerves in numbers varyi according to the species of animal and the nerves un observation.

They do not exist in the special nerves, for example, optic. The olfactory nerve contains nerve-fibres devoid myelin, but these latter are wholly special, and should classified and given a special description under the head the terminations of nerves in the organs of special sen

It is only necessary to know where Remak's nerve-fib are to be found: our description shall be made by th found in mixed nerves.

Nerves which contain many of these fibres possess a gr or gelantinous appearance. In a state of relaxation th do not present as marked a pearly aspect as other nerv This modified appearance is due, in these as well as in myelinic nerves, to zigzags which the fibres form in interior of the nerves. Microscopic examination of a ne taken from the spleen and disassociated in water sho that the fibres composing the nerve are not arranged l myelinic nerve-tubes, to wit: like javelins in a quiver, ramify, anastomose, and form a network, the branches which approach one another, the interspaces of which unequal; the *resean* offers more resistance to teasing in o direction than in another. The meshes of the network quite irregular, very narrow and elongated, and alw have their long diameter parallel to the axis of the ner

* "Observations Anatomica et Microscopicæ de Sytematis Ner Structura;', Berlin, 1838.

The interspaces are of very unequal thickness; sometimes they are extremely delicate, at others they have the diameter of a medium-sized myelinic nerve; they also present intermediary dimensions.

Upon these interspaces nuclei are to be seen. They are generally presented in profile, and then seen simply to be applied to the surface of the interspaces. Sometimes they are seen in the centre of the interspace and in full view. At other times, too, they seem to occupy the interior of the interspace in profile; this would seem to show they are placed in the interstice of the two united fibres constituting it. Their disposition is not regular, and the interval between them is variable.

If a nerve, largely containing Remak's fibres, be submitted to the action of acid osmic and disassociated, the first fact which attracts our attention is that Remak's fibres remain uncolored whilst the myelinic nerve-tubes, even of the smallest diameter, are colored black. We may, therefore, conclude that Remak's fibres contain no myelin, or, at least, not enough to be acted upon by the reagent. Acid picric specimens stained with picrocarmine, Remak's fibres show indistinct, irregular, granular, longitudinal striation of those fibres.

If a dog's pneumogastric be acted upon and disassociated in acid osmic, and then submitted to the action of picrocarmine, we first notice that Remak's fibres possess a well-marked longitudinal striation, of such a character that the fibres seem to be formed by a series of juxtaposed small filaments.

The nuclei (with their nucleoli) and their surrounding protoplasm are perfectly clear. The preparation demonstrates that the nuclei are always applied to the surface of the fibres; when they appear to be in their interior it is because a nucleus is situated at points where two Remak's fibres are about to be united or separated, and seems to be situated in the interior of this interspace, when really it belongs to one of the fibres and is applied to its surface.

Finally, this same specimen demonstrates that Remak fibres are not connective tissue fibres, since the picro-ca mine has feebly colored the former whilst the latter remain absolutely uncolored. If red aniline be used, all doubt are at once dissipated by the deep red color of the forme and the absence of color in the latter.

Although I have made a great number of specimen very recently, too, with silver nitrate, I have never see any indication of the soldering of two cellular element or any transverse striæ in Remak's fibres. I, nevertheles do not consider the question as definitely settled. Perhap the organic salts of silver may give different results. should add, I have used silver lactate with negative result

In specimens, prepared after the ammonia bichromat method and stained by picro-carmine, we note that, asid from the characters above described, each large Remak' fibre is composed of several fibres of very small size, eithe soldered together or separated over a certain distance. I each elementary fibre a large number of round or ova vacuoles are to be seen; they are uncolored and characte ized, all vacuoles, by less refringence than that of th medium in which they are formed in the interior, even, o fibres which have been enlarged at their site, whilst else where they are delicate and have thus become moniliform

Transverse sections of a dog's pneumogastric or sciati nerve, after treatment with acid chromic and picro-carmine show, within the laminated sheath and between the mye linic nerve-tubes, very small, red, granular, irregular islets which correspond to the fibres of Remak. There is als one elongated islet, situated immediately below the nerve' sheath, and distinct from the rest; this represents the sec tion of the sympathetic nerve, which, as we know, i intimately united to the vagus. In these red-stained islets we are able to distinguish, by the aid of high powers, a series of very fine circles, pressed closely together. These circles represent the transverse section of the fibrillæ con stituting the fibres of Remak.

This confirms our observation of their fibrillary structure when we examined them lengthwise after having disassociated them in acid osmic.

These are all the positive facts which we have acquired upon the constitution of Remak's fibres. But there are certain problems to be solved and hypotheses to be formulated upon this subject.

The first problem is in relation to their fibrillary structure. It is probable, indeed almost certain, that the fibrillæ we have recognized correspond to the axis cylinder. But this notion does not suffice, and pushing our analysis further, we should ask whether the juxtaposed axes-cylinder are absolutely uncovered or surrounded by an envelope. I know no method which can give any exact results upon this subject; the elements in question are so delicate, it is difficult to pronounce definitely, consequently I must lay this question aside without any reply until I speak of the morphological constitution of Remak's fibres. Second question: Are the fibrillæ placed side by side, like arrows in a quiver, or are they united by some cementing substance? This question is confounded with another, in relation to the nuclei and protoplasm.

It has been impossible for us to distinguish above the nuclei any contour which corresponds to a membrane like that of Schwann. It might be claimed that such a membrane is so extremely delicate, possessed a refringence so close approaching the medium in which it is situated, as to absolutely escape detection. I shall nevertheless assert that, *a priori*, I do not beleive so. In fact, if it existed, this membrane would be the envelope of a cell, and if Remak's fibres were surrounded by cellular segments lined by membranes, analogous to the interannular segments of myelinic nerves, silver nitrate should disclose the soldering by black lines. But it does not. We are right in concluding that Remak's fibres do not possess any properly-called membrane.

This absence of all traces of soldering authorizes us to add that the nuclei do not belong to so many distinct cells,

to the people of this entire country, but especially to the whites of the South. And while he is, perhaps, for a great while to come, not to be a very important factor in the practice of dentistry, anything relating to his physical well being must interest the earnest seeker after truth who may belong to our calling. When I entered the dental profession, now nearly forty years ago, the opinion prevailed among dentists and physicians that the colored population of the slave states entire, were blessed with much better teeth than the whites of the same region. A little observation showed the fallacy of this opinion, that in fact their teeth were in quality far below those of the whites. A little investigation showed that this opinion resulted from superficial knowledge, that the careless observer was misled first, by the glaring contrast between the color of the teeth and gums, for it must be borne in mind that the pigment giving color to the skin does in a large majority of cases also color the lips and gums.

"Then it is true that the negroes' front teeth do not, under like circumstances, decay near so early or certainly as in the white races, mainly because the dental arches or maxillary bones are almost universally much larger proportionately than in the white races. Under similar condition the negro and all who have an admixture of his blood, lose their teeth by decay, at a much earlier age than the whites. You ask me the cause of this, I answer, first, the inferior texture or quality of his teeth, and this fact applies to all the tissues of his body. He is, without exception, of scrofulous diathesis, all his tissues are softer or more loose in texture than the whites. True his bones are larger, but they are less dense in their structure, and being softer are less liable to fracture. Their muscles are larger, but are less solid, he consequently wastes more rapidily when diseased. Destructive inflammation occurs more readily, and to a greater extent from like causes than in the whites. He succumbs sooner to inflammatory disease than the white races in the same country, and laboring under the same dis-

ease. In one notable exception he is exempt, (yellow fever), in all others he is more liable to disease. Lessions occur at an earlier date and terminate fatally more frequently, consequently he is shorter lived. So marked is this tendency to destructive inflammation that it is almost useless to attempt to save pulpless teeth, except those which have single roots. It is time and labor nearly thrown away if expended on the bicuspids or molars, after the devitalization of the pulp, only a short time elapsing after filling, before inflammation and abscess occurs, save in a few exceptional cases. To sum up the negro is scrofulous, his teeth are large, of soft texture, the bicuspids being deeply marked with fissures, often to the extent of exposure of the dentine, they are subject to early decay and loss. When the pulp is lost the roots are a much greater source of irritation than in the whites; the gums take on fungous growths much more readily, and he loses his teeth, especially those posterior to the canines, at a much earlier age. He succumbs more easily to disease, and on an average, I believe, does not live to so great an age. The mulatto universally has poor teeth; they are more frequently of a pearly cast than the pure black and decay in early life. In a practice of thirty-five years in the States of Kentucky and Tennessee, I have seen but two mulattoes of mature age who had sound teeth. If the mulatto co-habits with the white, their progeny, to a large extent die before maturity, and physical degeneracy is marked and rapid. If cohabitation is with the mulatto the family is usually small and short lived, if with the black their issue is an improvement on the mulatto, the teeth always partaking of the general physical characteristics."

J. H. Coyle, D. D. S., Thomasville, Georgia, says: "The teeth of the pure blooded negro are very much better than those of the white race. The teeth of the mixed race are not as good as those of the negro. They are not as good as those of the white. Ninety per cent. of the irregularities exist in the white race and ten per cent. in the mixed. I never

saw a case of irregularity in the pure blooded negro. The nearer you approach the normal status, that is a full white, there is improvement in the general character of the teeth.

"The gums of the negro are always in the very highest state of health; variable in the white; and the only condition I have ever noticed as occurring frequently in the gums of the mixed race, is more frequently a spongy condition.

"The pure blooded negro taken from the plantation and converted into a house servant, partaking of the same food as the white, rapidly lose their teeth by caries, especially the next generation of them raised up under such surroundings."

Dr. T. C. Edwards, of Brownsville, Tennessee, says:

"The teeth of the negro are not as good as those of the white race, in this comminity at least.

"The teeth of the mixed race are not as good as those of the black, therefore not as good as those of the white race. There is but little irregularity of the teeth among the negroes.

"I do not see that a predominance of "white blood" makes any material difference unless for the worse. I never believed that the mixed race had any permanence. I believe they will eventually go back either to the one or the other type, or degenerate and become extinct.

"The negro does not have gums of as delicate structure as the white race, but they yield readily to disease, (as do the teeth of the negro; when caries begins in their teeth they seem to melt away as wax.)

"The gums of the negro as well as the mixed race, as a rule, are not healthy, owing to their careless and filthy habits, and disregard of health rules. This may explain in a great measure the condition of their teeth."

Dr. J. P. Johnston, of Marion, Alabama, says."

"There must be some standard by which to judge. I will base my opinion, therefore, on the ground that the

teeth of both races received the same attention. As a rule the teeth of the negro are much larger and more fully developed, result of mode of life, diet, etc. But to answer the questions: The teeth of the negro are better than the white race. The teeth of mixed race are not as good as those of the black. They are as good as those of the white race.

"Irregularities of the negro's teeth are very rare; largely predominates in the white race over the mixed or black. As the blood of the white race predominates the teeth are softer, enamel not so perfect.

"The gums of the negro and mixed races are better than the white race."

Dr. E. M. Allen, Marietta, Georgia, says:

"I think the teeth of the negro better than the white race. I do not think the teeth of the mixed race as good as those of the black. They are probaly as good as the teeth of the white race unless they inherit from the blood of the white greater tendency to decay. Much less number of irregularities occur in the black than white race.

"There is a perceptible change in the teeth as the blood of the white predominates."

Dr. W. D. Dunlap, Selma, Alabama, says:

"The teeth of the negro race in this region, whether in town or country, are inferior to the teeth of the white race. The mixed race have more defective teeth than either the black or white, more sensitive and difficult to preserve.

"Irregularities largely predominate in the white race."

Dr. A. F. Claywell, Lebanon, Tennessee, says:

"Under similar conditions of habit and occupation, there is no appreciable difference in the teeth of the races.

"The teeth of the mixed race are far inferior to those of either the black or white races. As the blood of the white race predominates irregularity increases. The gums of the white race are inferior to those of the mixed or black race, black best."

Dr. S. P. Buatt, Bastrop, Louisianna, says:

From theory and experimental facts, negro as an inferior being in existence and purpose, practically proves his inferiority to all others in his dental development. In proportion to their proximity to the white race their teeth are superior to the blacks.

"Their teeth are not as good as those of the white race. In their respective order as primitive race classes, postulated as perfect physical developments, they are equally normal. But as irregularity is an abnormal condition, the proportion is with the whites, as the most advance in civilzation, and their approximate races.

"As the blood of the white race predominates, the superiority exists.

"In normal subjects there is no discrepancy in comparison, but as diseased conditions are sequences of vice and abnormalities, it is a compendium of physical depravities peculiar to hygienic aberations, consequently holds its comparison within the range of vital degradation, and cannot be estimated by observation aside from their concomitant causes."

As will be observed there is quite a diversity of opinion as to some of the questions. Whether latitude, longitude or altitude, has anything to do with it we are not able to say. One question all agree on, and that is, the regularity of the negros' teeth. From this we are to learn that nature, left undisturbed, will build out in symmetry and form beautiful to behold. The most perfectly developed beings of this continent are the negroes. Take him in his natural state from under the influences of modern civilization, he presents the most symmetrical form of all races. With civilization the negro degenerates rapidly, as is shown from the above answers.

Another question nearly all seem to agree upon, is the injurious effect of the amalgamation of the races. The whole physical structure of the mulatto is inferior to either the white or black race. They are very geneally of a nerv-

vous temperament, often in combination with the lymphatic. Their intellect is much better, and capacity for learning much greater than the pure negro. We believe it is generally conceded that the negro is the best natural singer of any nation on earth. We are not prepared to say about the native African. Cannot very much of this be attributed to their perfect physical development, especially the perfect oral development of the races? It is a fact that the mixed race, as they approximate the white race, lose this heaven born gift in its natural purity and volume. We leave the above question open to the profession. There is much to to be learned from comparison and observation. And with this subject fully developed light will be thrown in dark places.—*Southern Dental Journal.*

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## ARICLE IV.

### *Extraction of Teeth in Pregnant Women.*

From a report of the proceedings of the St. Louis Medical Society, published in the *St. Louis Medical and Surgical Journal*, we extract the following:

Dr. Borck.—I would suggest a question. Is it advisable to allow the extraction of a tooth, or of teeth in a patient who is pregnant? Several times I have been asked this question by dentists. Some eminent dentists are afraid to extract an aching tooth because the patient is pregnant. They are afraid of producing an abortion.

Dr. Green.—The extraction of a tooth in a pregnant woman does not necessarily produce an abortion. Of course there may be instances where such an effect would follow, but if the woman is suffering, and we cannot relieve her by any other means, I would recommend the extraction of the tooth.

Dr. McPeeters.—There is a form of tooth-ache which is sometimes a symptom of pregnancy. The teeth are sound, and of course it would do no good to extract them.

I should not hesitate to advise the extraction of a carious tooth, but in case of this neuralgia which sometimes accompanies pregnancy, I should advise against it, because we sacrifice the tooth uselessly.

Dr. Hughes.—I don't suppose we can adopt any one rule that will apply to all kinds of patients. Some patients when pregnant, are extremely hyperæsthetic; the hyperæsthesia extends to the branches of the fifth pair; other women, who are more or less nervous when not carrying a child, seem to possess more nerve then than at any other time; they seem to be in a better condition. I don't know in view of the varying and variable physiological condition in which we find women in the pregnant state, that we could arrive at any definite rule applicable to all cases. I suppose, however, that Dr. Borck has reference to the propriety of extracting decayed teeth—teeth which are themselves the peripheral source of great central irritation. Of course no one would think of taking out sound teeth to relieve a neuralgic condition. The question, ought a tooth to be extracted from a pregnant woman, is not a question upon which we could ever arrive at any definite conclusion which would embody a rule, and therefore it would be fruitless to engage in its discussion. If the question is asked: under what circumstances ought the removal of a tooth to be advised during pregnancy, you have a question that might be discussed. It is simply a question of individual temperaments, of conditions of the patient, and of the existence of centric or excentric irritation; the existence or non-existence of central or peripheral irritation. And, if a pregnant woman is extremely hyperæsthetic, and you can find a focus of origin for it in the peripheral irritation of a decayed tooth, there would be no impropriety, in the majority of cases, I apprehend, in the removal of that decayed tooth. If in a condition of general nervous excitation especially if centered in the brain or cord, you have any form of spasmodic display, and you find a possible peripheral sources of the irritation, I think the general sentiment o

the profession would concur in the propriety of removing that possible scource of peripheral irritation. That is all there is to that question.

Dr. Jonaston.—Some years ago I was called to a lady who had been married six or eight weeks. The second left molar was decayed and an abscess was forming, and protruded from the root of the tooth. The abscess was painful, and I advised opening it. She consented, and I took my lancet and opened the abscess. This produced a tremendous shock, and in twenty-four hours she aborted. This case occuring in my early practice, has made me very careful about extracting a tooth from a patient during the early part of pregnancy, if she were of a nervous temperament; it is a hazardous practice. But if the tooth-ache continues, the reflex irritation of the pneumogastric nerve, connecting with the great sympathetic, may induce uterine contraction, and cause the woman to abort. In such a case we should recommend that the tooth be pulled. There is no rule in the practice of medicine, and no rule as regards drugs, except castor oil. I have given calomel for twenty years under the supposition that it acted on the liver, and now we are told that it doesn't act upon the liver at all.

Dr. Hurt.—I think we are all obliged to concede the possibility of the extraction of a tooth during pregnancy producing abortion under certain conditions. There is no doubt, also, that there are circumstances under which the extraction of a tooth during pregnancy ought to be advised. The loss of a sound tooth ought not to be allowed unless something is going to be accomplished by it that cannot be accomplished otherwise. But I would have no hesitation about advising the extraction of a tooth from a pregnant woman if it was absolutely necessary to relieve her from a distressing, harassing pain that was wearing her out; and in doing this we may administer an anæsthetic without interfering in the least with the pregnancy. When she is under chloroform or ether, we obviate the shock which is usually attendant upon the extraction of teeth. And expe-

rience has taught that pregnant women are very tolerant of these agents.

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In writing to the *Journal of the British Dental Association*, Mr. Alfred Coleman says:—"*Apropos* of the interesting question raised by Mr. Sewill at the meeting of the Odontological Society, viz. 'The removal of teeth, under nitrous oxide, in advanced pregnancy,' I think the following case may be of interest to your readers.

A lady from Oxfordshire visited me on the 14th day of March last. She had suffered excruciating pain in the lower third molar of the left side, which she wished removed under gas, but I was informed by her husband that she expected to be confined in a fortnight. Now I was aware that this lady had been previously four or five times confined at the full period, but had never given birth to a living child; still as I entertained the views expressed by Mr. Sewill, that it was far preferable for the patient to have the tooth removed under gas than suffer the pain, which I have known to bring on a miscarriage, I willingly consented to its being administered to her, and removed the tooth.

On the 2d of this month I was pleased to hear from her own lips that on the 1st of April last she had for the first time given birth to a living child—a son. She also told me on this occasion that she came up to town without saying a word to her medical attendant, as she felt almost sure he would object to her taking gas, but on that matter she relied more upon my opinion.

As my patients are people of considerable property, this this is a gratifying circumstance."

And the same journal says:—The following extract will be read with interest. It is an able summary of the evidence bearing upon maternal impressions, and it supports the view expressed at this meeting, namely, that the popular notions on this matter are not based upon science. We take the excerpt from the just published admirable work of Mr. Noble Smith on the "Surgery of Deformities." This

book will well repay the perusal of those specially working at the subject of deformities of the jaws. Although it does not deal specifically with this topic, there are many points connected with the origin and pathology of deformities generally, which have a connection with those of the jaws and neighborhood.

"MATERNAL IMPRESSIONS.—The belief that a maternal impression can produce deformity *in accordance with the idea of the mother* has a very acient origin, and is entertained by many medical men at the present time. It therefore becomes necessary to state the following facts, which are in opposition to such belief:

1. That the resemblance of the deformity to the object which has impressed the mother is generally an imaginary one.

2. That the maternal impression is almost invariably only alluded to *after* the discovery of the deformity.

3. That the ovum as soon as it leaves the ovary, ceases to be connected, either by the nervous or vascular systems, with the mother, and therefore, in resembling very closely the egg of an oviparous animal, becomes almost equally unlikely to be influenced in the manner referred to.

4. That from the nature of the deformity we may usually know that the error in formation must have occurred at a much earlier period than the date of the supposed cause, and this is especially the case when the error is one of excess.

5. That, in the words of Dr. Blundell, 'it is contrary to experience, reason, anatomy, to believe that the strong attention of the mother's mind to a determinate object or event' can cause 'a specific impression upon the child without any injury from without.'

A great shock to the mother, even if only a maternal one, may effect the general condition of the fœtus, may retard its development, or may even cause its death; but that the mother's mind being affected by the sight of a deformed or injured hand, lip, or other portion of the body can produce a

malformation *of a corresponding part of the body* of her child *in utero* is a supposition which physiological facts will not allow us to entertain.

If it be thought necessary to pursue this subject further, the only manner in which reliable evidence can be obtained is as follows:—The observer must question each mother *before delivery* as to any impressions she may have formed upon the subject, and compare these with the actual condition of the child when born. It is probable that nearly every pregnant woman entertains doubts and fears with regard to the condition of her coming offspring, and that when her child is born in a normal condition all apprehensions are soon forgotten, but that when an abnormity exists the fear is magnified into an important fact.

In past ages congenital deformities were attributed to various causes, amongst which may be mentioned Divine vengeance, witchcraft, intercourse with animals, &c.; but the knowledge which we now posess of the various phenomena of embryonic development enables us to determine that many deformities depend either upon *arrest* or *excess* of the processes of formation."—*Dental Advertiser.*

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## *The American Academy of Dental Science.*

The fifteenth annual meeting of the American Academy of Dental Science was held at Young's Hotel, Boston, on October 25th. The morning session was chiefly devoted to the regular business and to the election of the following-named officers: President, Dr. G. T. Moffatt; vice president, Dr. J. H. Batcheller; recording secretary, Dr. H. F. Hamilton; corresponding secretary, Dr. E. B. Hitchcock; treasurer, Dr. E. H. Smith; librarian, Dr. H. C. Meriam; executive committee, Dr. C. P. Wilson, Dr. E. C. Briggs and Dr. J. S. Mason. Dr. S. J. Shaw, and Dr. F. E. Banfield were elected active fellows. The afternoon session opened with the annual address by Dr. Frank Abbot of

New York on "Dental Education." The paper was chiefly devoted to emphasizing the necessity of young men's hav- a thorough medical education as a preliminary to the study of dentistry, and the need of Massachusetts following the other States in obliging practising dentists to have a suitable degree or to pass an examination before a State examining board. Dr. W. H. Atkinson of New York read a paper on "Artificial Teeth," giving valuable ideas on the subject, and on the healing of tissues. He unqualifiedly condemned celluloid and vulcanite as base-plates. Dr. A. W. Buckland of Woonsocket, R. I., read a paper describing a method of filling by covering a lining of cement with amalgam while both are in a plastic state. He deprecates the use of gold and severe methods with patients needing gentle treatment. Resolutions were passed on the death of Dr. J. E. Fiske of Salem, and Dr. W. H. Allen of New York, both honorary fellows of the Academy. The annual dinner took place at five o'clock. Many distinguished dentists from other cities were present, and the meeting was one of the most valuable, both prefessionally and socially, ever held.

H. F. Hamilton,
*Recording Secretary.*

124 Commonwealth Ave. Boston.

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# EDITORIAL, ETC.

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*Dental Education*.—The winter or regular Sessions of the Dental Schools throughout the country have now fairly commenced,

and are no doubt being conducted with the characteristic energy which distinguishes such institutions. While, owing to the large, number of such schools, some are struggling for existence, the attendance at the more advanced institutions is large and everything is progressing in a satisfactory and harmonious manner.

Since the issue of the October No. of this JOURNAL the *unprecedented* success of the Dental Department of the University of Maryland has continued until at this time (the first part of the month of November) the number of matriculants is considerably over sixty. Such an auspicious opening of the *first* session of this University Department is not only gratifying but beyond expectation, and will be received by its friends as an indication of what the future may develop, and also an evidence that the dental profession generally regards a reputable University as the proper place for the instruction of dental students.

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# MONTHLY SUMMARY.

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*Zinc vs. Babbitt Metal.*—Thirty years ago a partner of mine, Dr. D. H. Goodno, after experimenting with all metals ever used for dental dies, and finding nothing satisfactory, at last thought that "Babbitt metal," then but little known, might answer the purpose. He tried it, and found, to his great relief, that it was just what he needed. We adopted it at once, and after having used it exclusively all these years, can say it is a *perfect thing* for the purpose. And why should it not be? It has all the

requirements needed, viz.: *non-shrinking, hardness, toughness, smoothness*, and melting a ta low temperature. Now, while *zinc* is *hard*, its shrinkage is a serious objection. *Type-metal* does not shrink, but is too brittle.

But it is necessary that the Babbitt metal should be made from a correct formula. Much that is sold, while it answers the purpose for which it is generally used, viz.: bearings for machinery, is made in such a manner that it is too soft for dies. Metal that costs less than forty cents per pound will not answer, for it can't be made and sold for less. To ensure a good article, make it yourself, as follows:

Copper, 1 part;
Antimony, 2 parts;
Tin, 8 parts.

Melt in a crucible, *in the order named*, turning off as soon as the tin is dropped in, and remelt. The S. S. White Co. is now making the above formula. For counter die, use seven parts lead and one part tin, and don't turn too hot; coat the die with whiting. For convenience, moisten the sand with sweet-oil, as it is then always ready for use, and there will be no danger of your cast being spoiled from excess of moisture.

I seldom make the second die, even in sharp, irregular, lower cases. The plate will *always* fit the plaster model, and if that is correct, will, of course, fit the mouth. It is time that zinc was banished from dental laboratories, books of instruction and colleges. There is no more need of it than of the "fifth wheel to a coach." On the other hand, it is simply a nuisance, as any one will say after following the above directions half a dozen times.—*L. P. Haskell, (Chicago, Ill). in New England Journal of Dentistry.*

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*Acute Conjunctivitis Cause by the Electric Light.*—Dr. W. C Rockliffe records, in the *Lancet*, the case of a man who was engaged in adjusting the carbon points of a lamp of 3000 candle power, without wearing the colored glases commonly used to protect the eyes. As an almost daily occurrence the brilliancy of the spark causes more or less paralysis of the retina, or, to quote his own words, "he rarely is able to perceive the peo-

ple walking on the footpath when descending the ladder from adjusting." Although this affect soon passes off, on this particular occasion, as he regained his power of vision (in about fifteen minutes) it was followed by rapidly increasing lachrymation, photophobia, pain and swelling of the lids, the whole symptoms being developed in thirty minutes. Having suffered from many slight attacks of a similar nature. he applied cold water, which previosuly had relieved him ; but the pain and swelling increasing, I saw him the following day, apparently having suffered intense agony during the night. The lids of both eyes were very hot, red, swollen, and brawny, and level with the superciliary ridge, the swelling extending some little distance upward over the forehead. The pain was most acute in and around the eye. On raising the lids (which was a very diffcult operation the photophobia being so exceedingly intense) a considerable amount of lachrymal fluid gushed out. The conjunctival vessels were exceedingly large, and the eyeball a brilliant scarlet; cornea clear. All these symptoms yielded to a brisk purge and lead lotion in forty-eight hours. His fellow workmen was similarly affected, but to a less extent.

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*Nitrous Oxide.*—Further experience has not changed the relative position or much enlarged the sphere of action of nitrous oxide. That it is the safest of all anæsthetics has been established beyond a question. In one institution where such administration is subject of record, this gas has been given over 100,000 times, and not only without a death, but without causing in a single instance symptoms sufficiently serious to necessitate transporting the patient home in a carriage. In the city of Philadelphia alone, it has been given over 133,000 times without a death, and without any injurious result. Death cannot be justly attributed to it in more than four cases since its introduction.—*F. C. Reeve, in Holmes' Surgery, American Edition.*

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## ARTICLE I.

### *Nervous Force: Its Origin and Physiology.*

BY W. C. BARRETT, M. D., D. D. S., BUFFALO, N. Y.

[Read before the American Dental Association at its Twenty-Second Annual Meeting, held in Cincinnati, August 1–5, 1882.]

There are two things of which I wish to speak, and these two things make up the sum of the whole universe so far as man can know: they are matter and force. I say the study of these must form the whole, the entirety of human research, so far as any positive knowledge or the hope of definite information is concerned. We may speculate and theorize and dogmatize upon things spiritual and metaphysical as much as we like, but concerning them we can by no possibility arrive at any definite conclusion, nor can we *prove* any assertion, it matters little how wild it may be, as either absolutely true or false. When we come into the domain of physics we are studying the actual, the real, the tangible.

I desire, then, for a few moments to consider, in a general way, matter and force—the one real, positive, palpable, inert; the other immaterial, etherial, incorporeal, yet dominative over the tactile mass; a law which is ever

active in bringing about definite changes in the passive matter; a ghostly, pervading something, which changes a dead, a lifeless, an inanimate mass of chaos into this world of life, and joy, and beauty, and animation.

What is this mysterious influence that we call force? Let us examine it. But in what I shall have to say I desire it ever to be borne in mind that I am speaking solely of physics, and that it has no kind of metaphysical or speculative application whatever. The relation of mind to matter, it is no part of my present plan to endeavor to trace out.

Force can be studied only through its chief resulting phenomenon—motion. We find that matter and force are infinitely opposed. Matter seeks eternal rest, force, perpetual motion. They mutually react upon each other, matter being by force constantly changed in its characteristics, force by matter continually varied in mode of manifestation. They are thus mutually interpendent, co-existent, eternal parts of one stupendous whole. Interpendent, because one cannot form a portion of this universe without the other: co-existent, because each pervades the other, and eternal, because both can die only together.

It has long been an axiom in physics that matter is imperishable. The same train of reasoning which proves this, establishes also the fact that force is indestructible.

If an atom can change its condition only through the exertion of force, if its form only can be altered, the bonds, which unite it to certain other atoms only be liberated to enable it to form new unions with yet other atoms, and if not one of these particles can be lost or annihilated, then can force only, by the reaction of matter, be induced to change its mode of manifestations or its direction. If not an atom has ever been destroyed since matter existed, then it necessarily follows that not an influence, not a wave of force, has ever been extinguished since, simultaneously with matter, it first exerted sway. We may, through the action of force, alter the condition of matter; we may,

through the reaction of matter, change the character of force; but both are unlike indestructible and eternal. Matter is all one, under whatsoever form it may exist. Force is a unit, however it may manifest itself. These are predicates, truisms, self-evident, self-proved, fixed laws of physical science. This doctrine is not new, for as long ago as 1845, Faraday declared that he held the opinion that the various forms under which the forces of matter are made manifest have one common origin, and are so mutually interpendent that they are convertible one into another, and possess equivalents of power in their action. To my apprehension, matter and force are as intimately connected as are what Faraday calls the different manifestations of force with each other. We cannot conceive of matter except as it be subject to force. We cannot imagine power as distinct from the matter upon which it acts. They are essentially co-existent, coeval, synchronous.

Force may act upon matter in different ways, and the result may be motion of a mass, or of atoms. The changes consequent upon this action may be those of external form —morphological—or of internal structure—molecular. According to the peculiar manifestation of it we have been accustomed to call it Heat, Light, Electricity, or Chemical affinity; but in whatever mode it becomes sensible to our preceptions there is one definition which will always describe it, one expression which always characterizes it. It is essentially matter in motion. Heat was formerly regarded as a subtle substance, with unknown, tangible qualities, and its specific name was *Caloric*. It was, with Light and Electricity, classed as an inponderable fluid, because it was conceived that no other hypothesis would account for the phenomena which it exhibited. Light, it was supposed, consisted of minute characteristic particles which proceeded from the sun, or from any luminous body. Electricity also was regarded as an invisible entity of some kind, possessed of peculiar qualities. It was known rather by its physical manifestations than from any knowledge of

its character, but the general opinion held it to be an extremely tenuous matter, which, while pervading most substances, could yet be bottled up, confined, or dissipated at will. It was usually spoken of as the electric *fluid*, and in my early school days I was taught that there were two kinds of electricity—a positive and a negative—which were always seeking to neutralize each other. Further study and investigation made manifest the absurdities of these crude theories, and a new hypothesis was invented—that all these supposed entities, these actual, positive existences of some kind of matter called light, heat, etc., really acted through a specific media—a fluid which pervaded all matter and all space, an invisible, intangible ether, which, once put in motion by the action of light, heat or electricity, had sufficient power to produce all the violent phenomena which were supposed to be the effects of these agents, and this hypothesis is held by most people to-day.

Count Rumford disposed of the material theory by immersing two iron or steel bodies in cold water, and then, by the friction or attrition of the one upon the other, gradually raising the water to the boiling point. This was the initial attempt at removing the consideration of the study of force from the domain of metaphysics to that of physics. Prof. Grove first publicly announced the modern theory that the so-called imponderables—light, heat, electricity, etc.—are peculiar states of ordinary matter; that they are resolvable into motion, and that they are, in fact, all very closely connected, and the new doctrine was denominated the Correlation of Physical Forces. The theory was taken up by others, the real nature of the so-called forces was studied, and the further proposition was enunciated that they are all mutually convertible into each other. It was necessary in the consideration of these forces to study them in their manifestations, to compare them with other physical phenomena, and note their resemblances or their discrepancies. It has been determined that most, if not all, the forces, progress by means of an undulating or wave-

like motion, unlike the advance of the concentric waves made by casting a stone into a smooth body of water. This hypothesis is firmly established as regards sound, not only by actual measurement of the vibrations of resonant bodies, but by the very structure of our own auditory apparatus.

The vibrations produced by light have not only been demonstrated, but accurately measured. And not only this, but it is very clearly shown that the different colors of the solar spectrum are produced by a definite number of vibrations upon the retina of the eye. Further, the very number of these wave-like beatings have been ascertained and counted. The most delicate, but at the same time the most determining experiments have been conducted, and these demonstrate that to produce the color at one end of the solar spectrum, red, 480,000,000,000,000 of these vibrations must impinge upon the retina in each second; while to produce violet, the color at the other extreme of the spectrum, the number of vibrations per second is no less than 728,000,000,000,000.

The same arguments which are applicable to the undulatory theory of the progress of light, are equally pertinent in the consideration of electricity, for its mode of progression has been shown to be nearly allied to that of light.

And now let us for a moment consider the characteristics of some of these forces. Sir Humphrey Davy says that the immediate cause of the phenomena of heat is motion, and the laws of its communication are precisely the same as the laws of the communication of motion. We know that all molecular movement is accompanied by the evolution of heat to a greater or less degree. This is equally true whether it be of the changes incited by what is known as chemical action, or the motion induced within the mass of iron upon the blacksmith's anvil. We also know that the same molecular disturbance generates what is known as electricity, and that both these elements are operative in inducing that change sometimes called chemism. It is

equally true that each of these forces is convertible into any of the others. Thus, if we commence with chemical action, we all know how, within the cells of the battery, this action is made manifest in the electrical current, and thus chemical force is converted into electrical force. If, now, this force be generated in sufficient quantities and conducted along a wire of sufficient size for its easy transportation, and if in this "circuit" a piece of small platinum wire of such size as to partially obstruct the "current" be inserted, we all know that the platinum wire soon becomes red hot, and we see an instance of the conversion of electrical force into heat. The galvano-cautery is an instance of this. If, now, the current be increased and the obstruction be entire at one point, the most dazzling radiance is manifest, and here we have an instance of the conversion of electricity into light. The electric light is an illustration of this.

Here, then, commencing with that simple molecular disturbance within the battery, we see the force generated by those movements manifested first as chemical action. This is converted into electricity, the electricity into heat, and the heat into light, and all without the addition to or the subtraction from the original force as first made manifest, of anything whatever. This proves conclusively that whatever name we may give the phenomena exhibited, they are all due to the same cause, have the same origin, are convertible the one into the other, are in fact all the same thing, differing only in the mode of their manifestation and the accompanying phenomena.

The sun is the great source of light and heat for this earth. The so-called rays of the sun may be made manifest to us in many different ways. If, for instance, we take our stand with that body exposed directly over head, its nfluence is chiefly exhibited to us through that which we call heat. But we may interpose between us and the sun crystals of alum, and these will intercept those undulations which are known to us as heat; or, in other words, it will so change the character of these vibrations that the sun's

influence is no longer manifest to us as heat, but the heat rays have become light beams. In other words the heat is converted into light. Again, we may interpose another substance and there is neither heat or light in the sun's influence, but its rays now induce those molecular changes which we know as chemical action. Thus the same ray of the sun may be changed and made manifest to us as light, heat, chemism and electricity.

Force, then, is but a mode of motion, and according to the manner in which it is manifest to our senses we call it by the names which I have considered. But force may remain latent for an indefinite time. In my school-boy days, when we considered heat or caloric, we called it either sensible or latent. Further study will teach us that such terms are the result of our lack of understanding of the subject. There may, in one sense, be such a thing as latent force, but heat is only a method of the manifestation of force. The sun, as I have said, is the origin of all force, because within its body certain changes were originally organized and put in motion, whether by Omnipotent Power, as our system of theology teaches, or by inherent qualities, as materialists claim, matters not in this connection. These molecular changes are the origin of the unit force. The effect of these changes is eternal, imperishable, indestructible. But they are necessarily incessant. They may be stored up, imprisioned, only to be liberated through the transferrence of some other influence, as thus: In the early carboniferous ages, the force liberated through the changes going on within the sphere of the sun being manifested upon the earth as light, heat and chemism, induced certain molecular changes here, which resulted in the new combination of the elements of matter then existent, and the consequence was an extraordinary organic growth, and the formation of the carboniferous forests. The continued force which has its initial point in the sun, still active, but modified by previous changes of the same matter, and by self-limiting, environing circumstances, finally resulted in

those immense carbon deposits which to-day form our coal fields. The coal which burns in my grate is but the imprisioned force which was originally derived from the sun, and which came in form of light, heat, electrical and chemical changes. For the proof of this we have but to subject it to favorable influences and there will be returned to nature the same identical light, heat, chemical and electrical forces which so long ago lay inactive, dormant, latent, imprisoned within the coal bed. It is capable of demonstration that the amount returned is the exact amount so long ago received from the sun. But the light, heat, etc., or in other words the force liberated in my grate, is not lost or wasted, but is absorbed, appropriated, perhaps imprisoned, within other masses of matter, to be in turn again yielded up, and again utilized. Or, it may be, the force so eliminated from the coal is at once made manifest in some other mode of motion, and thus transmitted on, and on, now exhibited as heat, now as electricity, and again as light or chemical affinity.

I might enumerate innumerable instances wherein one manifestation of the unit force is changed into another. I might speak of the heat, the light, and the electricity, which in various ways accompany or are the result of chemical action.

I might show that electricity, and light, and chemical action, are ever attendant upon the development of heat, and that heat and light, and electricity, are the accompaniments of the development of chemical action; but it is all summed up in the declaration that all movements of matter, in whatsoever way they may be brought about, are producers of the unit force in some one or more of the methods of its manifestation. I cannot open or shut my jack-knife without the evolution of heat and electricity in greater or less degree. If I bring the blade of my knife in quick, sharp contact with another substance sufficiently hard and brittle, heat and light are made evident to the senses, as in the use of the flint and steel.

The evolution of force and its methods of manifestation, are controlled by definite laws which are as yet in a great degree unknown to us. Prof. Grove says, that the law or rule as to the production of heat or electricity from friction or percussion is, that where the mutually inspiring bodies are homogeneous, heat is the consequence; but where they are heterogeneous, electricity is evolved, although either is in a greater or less degree the constant accompaniment of the evolution of the other. In fact, it is true that the production of one force or mode of motion is, as a rule, accompanied with more or less of the others. The beautiful photographic process, which is but the conversion into the molecular motion commonly known as chemical action, is accompanied with the evolution of heat and electricity, though in quantity not appreciable to anything but the most delicate apparatus. If I bend a poker across a chair back, the molecular disturbance of the iron, if it be measured by thermometers and electrometers of sufficient delicacy, will distinctly show an alteration in temperature and electrical condition; and this is true of every change in the relative relation of the atoms which go to make up matter.

Matter is composed mainly of four different elements: oxygen, hydrogen, nitrogen and carbon. Of these four, three are gaseous, and their atoms move freely, and with little friction. Many of the compounds of these elements are what is called allotropic or isomeric—that is, two bodies are composed of exactly the same number of atoms of each element, and yet they are totally unlike, because the relation of the atoms is not the same. Thus the oils of turpentine, lemon and juniper, are chemically the same, yet physically different. So that it is seen that very slight atomic or molecular changes produce wide divergencies in the character of compounds. Then, too, there is abundant opportunity for such changes to be brought about by a very slight exèrtion of force. The compounds of nitrogen (and this includes all the so called albuminoids) are very unsta-

ble, and are ever seeking for some more permanent union The exhibition of the slightest force is sufficient to induce disruption of imprisoned chemical affinities which ma result in wide changes.

Again, compound matter exists in a number of forms, a gaseous, liquid, and solid. Of these the first two are easil impressed, and molecular changes are constantly going on Solid matter exists in two different states—the colloid an the crystalloid. Of these the first is unstable and exceed ingly mutable. So that of all the forms in which matte exists there is but one in which it is not easily changed an made to assume new molecular conditions. We hav shown that every molecular disturbance, however induced is followed by the evolution or the transferrence of som one or more of the various manifestations of force. Give then, that most forms of matter readily undergo molecula and other changes, and that the manifestations of existen force, such as light, heat, chemism, etc., are constantl active, and that such action can by possibility only resul in still another transferrence of force, it may readily b seen how unceasing must be the phenomena presented b all these mutations and mutually induced changes. Ever wave of force exerted at the initial period of this univers has been, since that time, and will ever be existent, an either constantly, actively excited, or passively imprisione by superior force. Matter is, under the action of forc constantly being disintegrated, and its constituent particle built anew into fresh forms. And so this tearing down an redistribution of matter is, under the dominion of force constantly going on. Every organized being, whethe animal or vegetable, has its period of molecular aggregation of growth and so-called nutrition, of active, progressiv changes, and then the same forces which have resulted i the combination of the molecules which make up its sub stance, are again active in those yet further molecula changes which bring about its morphological destruction I say the same forces which brought together the mol

cules which composed this body of mine, will in time insure their separation, and thus bring about the disintegration of solid and fluid tissues, and return them again to the common stock of matter, while the energies which brought about these definite changes, through the reaction of the matter thus metamorphosed, will in time be transformed into other forces, and itself returned again to the parent or unit force whence it was segregated, and thus will all that which goes to make up this Ego, this individual I, be returned again to that great source from which it emanated.

If this dictum of the unity and the conditions of forces be admitted as true in its application to the various forces of which we have been speaking, are we not justified in assuming that the law is general throughout the material universe? And whether we study this unity as exhibited in the macro-cosmos, or in the micro-cosmos—in the revolutions of solar systems, or that affinity which binds together two atoms—in those early convulsions which resulted in the upheaval of continents, or the change which cumilates in the growth of a blade of grass—in the devasting earthquake, or the fall of a leaf in autumn—in the wheeling in infinite space of a planet, or the infinitesimal vibrations of a ray of light—in the action of volcanic fires, or the molecular changes within the single battery cell, we shall see that in any extreme it unfailingly exhibits the same characteristics. It is the exhibition of the same force which results in the molecular aggregation called man, and that of the lowest organic life. Within the two organizations constant definite changes are going on that differ but in degree. The results of those changes in the two are precisely alike in fact. Life, vitality, in the one is, in a physical sense, precisely what it is in the other, except that in the lower it is simple and all the processes are elementary, in the higher it is complex and not readily comprehended.

And now, having considered the law of the correlation of forces in its application to the lower forms of matter,

shall we stop when we are just upon the threshold of th secret places of nature? We have shown that in inorgani life the law prevails and answers all the phenomena ther exhibited. Shall we admit that the harmonies of natur become discords when they are played upon the strings c a more perfect instrument? As we rise in the scale c existence, shall we conclude that where, before, all wa beauty, and harmony, and exactness, now all becomes di cord, and falsehood, and incongruity? Shall we admit tha the laws which are universal in the lower objects, are su pended when we arrive at the point where they are mos needed to make things congruous? The world has lon accepted as a fact the belief that man is a law unto hin self, and that his physical being is not subject to the rule which govern all the rest of creation. The life of one c the lower animals was thought to be one thing, that of ma to partake of a very different essence. That the vitality c the shrub which grows by the wayside had no kind c resemblance to the flower which blooms in our garden Let us look into this thing.

My subject, as announced, is nervous force. Perhap many of you have wondered if I were to pay it the respec of a passing glance, and if so, what my long prelud meant. It was necessary that we first establish and mak clear to your comprehension the doctrine of the correlatio of forces, before we attempted to apply it to other an higher uses.

We have seen that the light and heat of the sun, unde favoring conditions, have developed or been transforme into other forces. We have examined those forces, an have found them a unit in their origin, though diverse i their mode of manifestation. We have seen that light ma be changed into heat, heat into electricity, and that int chemical affinity. That all these so-called forces are mutu ally interchangeable, alike, identical. That each is th result of certain molecular changes, themselves induce by manifestations of other varieties of the unit force. W

now that all organic bodies, whether of low or high egree, are composed of the same atoms that unite to form ther matter, and, therefore, they must be amenable to the ame laws.

There are certain phenomena connected with living mater called vital phenomena. Under the old hypothesis that here were many kinds of force, and that each was an ntity, acting in an independent manner upon such matter s was subject to its influence, it was easy to suppose that ervous force was a something distinct and by itself, and hat it was not subject to the laws which governed other orces. When it was believed that magnetic attraction was pervading something which established a kind of affecion between certain substances, and aversion toward thers, and that this attraction was a thing by itself, dominated only by its own laws, and owing no allegiance to the rinciples which governed the relations of other matter, hen it was easy to imagine that nervous force was a princile alike distinct, separate, and removed from all other lominant forces. In that early day there was no harmony n nature, but a continued clashing and discord among nutually contending forces. Let us now suppose that nervous impulse is but another mode of manifestation of the init parent force, and how quickly all becomes harmony nd beauty.

The lapse of time admonishes me that I cannot pursue his enquiry with all the minuteness with which I endeavred to examine the physical forces, but that all force is dentical, interchangeable and the same, seems to me plain from a number of reasons In the first place it is derived from the same source. The same molecular changes and mutations which in the battery cell result in the evolution, or more strictly speaking the segregation of electrical force. We are constantly supplying the elements of this nervous battery, in the food which we take, and these molecular changes which we denominate digestion and assimilation, result as such changes ever do, and must result, in the elim-

ination of a force which, in this method of manifestation, we call nervous force.

If an animal be deprived of every kind of food except fats, it finally dies of inanition, though there is no apparent emaciation. The changes incident and necessary to nutrition cannot be carried on in the absence of necessary elements. So the molecular changes of the digestive process having partially ceased, there is a consequent diminution in the evolution of nervous force, which finally results in complete functional stasis, or death.

Again, that nervous force is identical with the other forces is manifest from the fact that in many of its phenomena it is the same. As the light and heat are modified by other forces, as well as by the circumstances under which they are made manifest, so nervous force is dominated by the environments which surround its elimination and exhibition. The methods in which the changes which result in light and heat progress, the elements taking part in such changes, all have an influence upon the characteristic of the force so generated. This is also true of nervous force. When the molecular changes going on within the body in which is generated nervous force are most active, the force generated is great. When these changes cease, nervous force is no longer generated, and the body is dead. When the products of these changes are for any reason transformed into heat, as in certain pathological conditions like fever and inflammations, nervous force is decreased. If the body be subjected to intense cold, the transformation of these changes into force is retarded, and not only is the temperature of the body reduced, but nervous force is adminished, and the organs which are controlled and regulated by it become torpid. Certain drugs have the power entirely to suspend these transferrences of force, or to modify them greatly. So in the generation of other forces through the chemical or changes which induce them, the elimination or action may be modified or suspended by the introduction of interfering matter.

Nervous force may be changed into other forces, and on the other hand, light, heat and electricity may be transformed into nervous force. It is not sufficient that the tadpole be furnished with the necessary food and heat for its development into a frog. Unless light be given him he remains in his tadpole state. If heat be not supplied to the freezing animal there will be no nervous force, and how familar is every physician with the fact that when nervous force seems exhausted, the mere application of heat supplies the needed nervous impulse; how else than by a transferrence of the force? If I apply the poles of a powerful battery to the nerves of an animal in which the evolution of nervous force is quite suspended, all the effects of that force are manifested. The heart can be made to beat, and any special muscle to act as in life, for a limited time; how else than by the transferrence of this mode of manifestation of the unit force? Electricity seems more nearly correlated to nervous force, than is any other mode of motion. Indeed, in some animals they seem interchangeable at will. Thus the gymnotus, or electrical ell, by the possession of a more than usually complicated nervous apparatus, can give electrical shocks of a considerable power at volition.

The fire flies and glow-worms are also provided with special organs by means of which they can at will emit light, as the gymnotus does electricity; that is, nervous force is transmitted into light. In all such animals, when nervous force is exhausted, when they are tired out by continued irritation or excitement, this power to emit light or electricity is gone, and it returns only when the nervous impulse is again perfect.

The laws which govern the manifestation of nerve impulse are less understood than those dominating the other forces. The force itself seems, like an algebraic expression, to be raised to a higher power, but that it therefore differs from the others does not follow. When in the light of the theory of the correlation of forces it is intelligently

studied, we may hope that its phenomena will be better understood, and its conservation become a wrought on problem. We have learned how electricity may be stored up, imprisoned against a time of need. Why should we not discover the same thing concerning its nearly related nervous force? When the battery ceases to work we know how, within certain limits, to remedy the defect. What hinders our learning the same thing of the nervous system? Many men have striven to gain this knowledge, but not, so far as I know, in the light of the latest revelations of science. Nervous force has been regarded as electricity once was: as an entity, an entirety; as something distinct from other forces. It is time that men began its investigaon from another standpoint.

In the first pages of this hastily written paper I said that the progression of force is, so far as we know, by undulations, and onward, wave-like motions. This is by experiment demonstrated to be true of nervous force. Even the rate of this advance has been determinately measured, and found to be in the motor nerves about 140 feet per second; so that we see in its mode of progression it obeys the law governing other forces.

Of the manner in which nerve force is eliminated we know little, but that it is in some way through the nerve-centres we are convinced. Experiment has proved this and at the same time established the fact of its close correlation to the other forces.

When the nerve centres are destroyed or paralyzed, not only is the production of nerve force stopped, but the body quickly cools. Upon sending a current of electricity along the course of the nerves, the bodily heat or temperature rises, so closely are these forces connected. If an organic body be deprived of light, not only is nervous force diminished, but the temperature is lowered.

We have all known persons whose hair during conditions of nervous excitement would stand on end, and from whom at such times could be drawn distinct electric shocks. I

know a man who, by inducing a restless, agitated nervous state in favorable atmospheric condition, can light a gas jet by simply holding his finger tip to the burner. These states are always succeeded by nervous depression, undoubtedly due to a loss of nervous power, through its transmutations into electrical force.

That nervous force is very closely correlated with electrical force.

That nervous force is very closely correlated with electrical force is again proved by the fact that all persons of highly wrought nervous organization suffer extremely during electrical disturbances. So-called magnetic storms induce a condition of great nervous exaltation in many people. Nervously anæmic people derive strength from a gentle electric current, because of its conversion into nervous power. People who suffer from nervous irritability find an exacerbation into electricity. That is, when the lesion is of the nerve centres, the generators of nerve force, electricity is beneficial; when in the conducting nerve filaments, it is aggravative, for obvious reasons.

There are many other points and arguments which I should be glad to present, but this paper is already too long, and I must leave the consideration of the subject. I desired to say something concerning a kind of nervous ebb and flow in certain of the vegetable kingdom—to speak of the stinging nettles, and of certain jelly-fishes which without a discoverable nervous system, yet give distinct shocks through some occult means—to speak further of the inordinate waste of nervous force in certain states of excitement or passion—to say something about the anotomy of the nervous system, and to examine a little the phenomena of excessive nervous irritability I am even leaving almost untouched one great division of my subject—nervous lesions. I can only plead the vastness ot the subject, and the impossibility of doing more than to make a brief presentation of it within the limits of a paper like this.

The importance of a more careful study of the physiology of nervous forces is apparent when we remember that the type of American diseases is to-day distinctly nervous, and that from year to year it is growing more so. Reflecting men in the medical profession have begun to recognize that we are making little progress in learning to combat these ills, and are seriously looking about for the reason. Some of the most profound thinkers in medicine have turned their attention almost exclusively to this field. They have advanced little further than to discover the cause of certain troubles, and lament the inability of the profession to grapple with and overcome the difficulty. Books have been written which have stirred medical men up to a recognition of the importance of this subject, without convincing their authors that they themselves fully comprehend the matter. It it not time that enquiry took another direction? If any one has studied the subject from the vantage ground of the correlation of nervous impulse with the other forces, I am not aware of it; but I hope that this may be a door which shall enable some one to enter upon a field that will give richer returns than any have yet yielded.

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## ARTICLE II.

### *The Study of Diseases of Children.*

BY WM. B. ATKINSON, M. D.

I have selected as the theme of my lecture this subject, because I have long been impressed with its importance, and feel that it cannot be too frequently or too forcibly placed before the profession.

Children, the fountain, the origin of society, those who are to build up the body politic, must be healthy or we can not hope to have them grow up to a healthy adult age. It is appalling to every American who studies the subject to find that the native born is rapidly becoming outnumbered

by the alien. One great cause of this state of affairs is too well known to require mention here. But another cause, perhaps equally potent, is the neglect of the proper study of childhood and its diseases, and hence the great mortality in this class. I say the great mortality, for though we must admit that great strides have been made within the last few decades in the way of lessening this mortality, yet it remains painfully great. Observe the list of deaths in any of our great centres of population, and we are at once struck by the immense numbers of children. Now, when we reflect upon the former belief, held most universally, that it was virtually useless to hope to lessen this proportion, do we not have room to hope for a continuance of the improvement? Perhaps much of this mortality is due to neglect of proper sanitation on the part of the parents; and while much has been done to instruct them in this particular, there remains much to be done, not only in the way of instruction, but even by compulsory measures, that these little ones may be saved from the terrible holocaust. This work is eminently that of the physician—the caretaker—whose duty it becomes to prevent disease rather than to cure it. We should constantly instruct parents as to the value to their little ones of pure air, sunlight, cleanliness, proper food and exercise.

Perhaps, however, we may look a little closer home, and learn why these matters are so frequently neglected. For some reason the study of children and their ailments has generally been but little cultivated by the profession. We find this in our medical schools. Until very recently, while the chair of obstetrics included the study of women and children, the latter subject was so completely ignored that there was scarcely an illusion made to it. The chair of practice indeed treated of a few of the diseases incident to childhood, but their study as a special branch was never regarded; and though in a number of schools chairs have been made solely devoted to the subject, yet the attendance of the student upon these lectures is by no means obliga-

tory, and he is left to his own choice in the matter. Fortunately, many young men are impressed with the importance of the subject, and the class usually give full attention to this part of the course.

Engaged as I have been for so many years in this speciality, I have become forcibly impressed with some causes for the neglect of this study.

By many it is believed that it is extremely difficult if not impossible in many instances to ascertain the pathological condition of a child. Particularly is this maintained in the cases of very young children who are unable to make known their feelings. Now, we insist on the contrary, that by a careful investigation we may learn with greater readiness the true state of health, not by inquiry of the little patient, but by a rigid comparison of its objective symptoms with those which should obtain in a healthy child of the same age. We are less likely to be misled than in the cases of adults, who, involuntary it may be, exaggerate their feelings, or reply to our questions in such a way as to prove the folly of making our inquiries so that an affirmative answer seems to be expected. In fact, we frequently find this carried to such an extent as to make the whole examination a farce. Often a person will, by these replies, have diarrhœa and constipation, be sleepless and too drowsy, have pains everywhere, and yet by her actions prove herself able to move about without the slightest inconvenience. A literal report of the questions and replies at some of our clinics would be regarded as a caricature, and it generally requires a most thorough sifting to get at the exact truth, and this, too, when there exists no reason for any deception.

On the contrary, the baby, when properly interrogated, replies in such a way that no deception is possible.

Perhaps one great cause of the difficulty in the diagnosis in children, especially the very young is the utter want of knowledge as to what constitutes a healthy child. In my contact with students, and even with older members of the

profession, I have often been surprised at the ignorance shown as to many of the conditions of child-life.

Thus it becomes necessary for us to know what would be the normal state of a new-born child—as to its average size, weight, general appearance, pulse, respiration.

In this connection, fancy the error of a father who was panic-stricken to find that his month-old baby had aggravated palpitation of the heart, and his relief on being informed by the physician whom he had summoned that the normal pulse of a child at that age varied greatly from that of his own pulse.

The physician should not pronounce an infant to be suffering from diarrhœa because in its first months it has frequent evacuations.

He should know that it does not secrete saliva, and that every act of regurgitation from the overloaded stomach is not vomiting, so to speak, but is merely a wise provision of nature to prevent serious trouble in the alimentary tract or by reflex irritation elsewhere.

He should be informed by the normal frequency of its taking the breast, and the quantity taken at each time, that he may instruct the mother or nurse in those unfortunate cases where artificial feeding becomes imperative.

In short, let him learn all that can be learned about a healthy infant from the moment of birth, and trace its progress day by day, month by month, year by year, until it ceases to belong to the class of children, and takes its position as a mature individual.

With a thorough knowledge of all these points, he is now prepared to draw the line between health and disease, and to decide with more prospect of success as to the indications demanding medication or its omission.

Nor is this all, he must learn that, particularly in children, symptoms which often appear very grave are evanescent, and, therefore, must be guarded both as to his prognosis and as to the quantiiy of a remedy which he may order. You can understand this latter allusion when you

encounter a case in which a physician, no longer a neophyte has written a prescription for a four ounce mixture and gravely informed the parents that the child was in a very critical condition, and who returned the next day to find the patient playing on the floor, and the bottle scarcely touched as to its contents.

The reverse obtains in the following instance. Two children, a boy and girl, were attacked with diphtheria After some days a consultation was called, solely because the boy failed to build up. The latter could scarcely convince either the physician or the parents that the child was dying; and it did die, spite of stimulation and every effort that could be made, within a few hours.

Nor is this all, the girl, a year or two younger, some two or three days later, was placed at the table to eat its breakfast, with the idea that this would tempt it to eat more heartily. In attempting to swallow it chocked, and the physician coming in shortly, was informed that "some of the food had gone the wrong way," and he failed to recognize the presence of analysis of the organs of deglutition until he was shown this condition by another, Here again, death soon closed the scene.

Each case, each child, shouid be studied by itself. Its antecedents should be learned, every point in its history noted—its peculiarities, its surroundings, its relations.

No haste should be exhibited in arriving at a diagnosis nor should we refuse to listen to all the information vouchsafed by the mother or nurse. Frequently the clue is thus obtained and the knot untangled. Thus the annoyance might be spared which on one occasion occurred when the doctor pronounced it a mild case of "rubeola," while the old nurse said she never heard it called anything but "gum," and the result proved she was correct.

Inspect the child thoroughly, both awake and asleep, and particularly where the symptoms are obscure should it be examined undressed. The importance of this last will be seen by allusion to a case. A mother brought to me a

child aged between six and seven months. It appeared rosy, lively, healthy—natural in every way except that it would occasionally cry out in great pain. She informed me that two or three doctors had given her things to relieve it, but without effect. Failing to find anything to account for this sudden outcry, I requested her to remove its clothing. This was done with great gentleness, but I observed that the child screamed as it was moved. Almost as soon as its legs were exposed I recognized the trouble. There was a partial fracture of the thigh about the centre, and when the proper dressing was applied so as to prevent the motion of the broken bone the outcries ceased, and the baby was soon as well as ever. No doubt this was due to muscular contraction, as no history of any injury could be obtained.

Undressing the child not only exposes every part to view, but also gives an opportunity of seeing whether any part of the dress is too tight or not properly adjusted. Hence it behooves the physician to watch the process, though he may do this in a way not to attrct the attention of the nurse. He may thus detect errors which she would prefer to conceal.

Learn as to its diet. If hand-fed, inquire as to the amount given, the way it is administered, the proportion of water or other diluent. The latter is a most important item, as we constantly find our little patients starving slowly when they are supposed to be taking an abundance. A diet composed of one part milk and two parts water will not support a child. Under such a regimen it is always hungry, while the mother fondly, though ignorantly, believes that she is giving it a full supply.

In this connection we may allude to the need of an examination of the mother's milk when the child is failing in health. Inquire as to her health, whether she is pregnant or menstruating, for it is well known that both of these conditions tend to reduce the nutritive or healthful quality of the milk ; and though she may appear to have the usual

amount for her infant, it is so deteriorated that it fails to properly nourish the child, and frequently acts as an irritant to the stomach and bowels. Again, the habits of the mother are often of importance in giving aid in the diagnosis and treatment. Her occupation, her surroundings should be understood.

A case will illustrate this point. A child at the breast was suddenly attacked with apparent coma. By the time the physician arrived this was passing off, and no symptoms were present which could account for the attack. The mystery was readily explained when it was learned that the mother had been washing all the morning, and was so anxious to conclude her task that she did not either stop either to give herself or her child any nourishment. The moment she had finished, she had sat down, heated, exhausted, and placed the child to the breast with the result mentioned.

Anger, fright, any excitement, is always likely, and rarely fails, to produce evil effects upon the milk of a nursing woman, and she should be strictly charged as to suckling the child immediately after such occurrence. Perhaps many of us can recall instances where children have been seized with convulsions, etc., under such circumstances, and I doubt not that many of the ephemeral attacks to which children are subject are the result of such a course. Fortunately, nature in the case of children has great recuperative powers, and if left alone will often restore the child to its normal condition.

This point is one upon which I cannot lay too much emphasis—the power of nature to restore health. Perhaps this alone is the true secret why many, otherwise ignorant, and a certain set of practitioners are so successful in the treatment of disease. They say let the case alone, or leave nature to do the work. Medicine is given which is really nothing. Rest and the most rigid diet are enjoined, and thus nature is not interfered with, and proceeds in her own way to restore the health. We should be content in every

instance to act with our medicine solely to meet a positive indication. We are only the assistants of nature; we have not the "healing power in our hand," and it becomes our duty to act by removing causes where they can be reached, to relieve pain, and particularly to see that those who are administering to the sick do not by their officious kindness do too much, and thus interfere with the natural return to health. Perhaps one most important point for the young physician to learn at the very outset is that drugs are not all-powerful. That time, rest, diet, and numberless little things are truly the means by which we aid in the fight against disease.

Time is important, and we may illustrate this by the cases which we constantly encounter, where a child has a moderate diarrhœa, which, by care and appropriate regimen, would in a reasonable time disappear. But in our haste to cure we exhibit astringents, stimulants, narcotics, and a host of articles, often making the case much more serious than in the beginning, and nearly always retarding the progress to health.

One of the earliest duties in caring for a case of sickness in a child is to observe the indications which present and act accordingly. Thus, in a diarrhœa, he should know for himself the exact appearance of the stools, their color, consistence, quality; the presence of blood, mucus, foreign matters, membranous shreds; frequency, the presence of pain, before, during, or after evacuation; whether there is also vomiting, abdominal tenderness, acidity of the evacuation, unusual fetor; each of these points will give him an indication to meet in the effort to correct the abnormal condition, and generally the next twenty-four hours will show an improvement.

In very many cases it is an excellent plan not to continue the medicine too long. Place the child on the road to health, and see if with a little supervision it cannot continue to improve. But do not too soon, while discontinuing the drugs, abandon the case as to diet, rest, etc. Some

people imagine the moment they cease to use medicine they are well, and can at once return to their former habits. Hence the frequent relapses in disease, and the necessity for enjoining most earnestly that no departure be made from the strict plan laid out until the physician allows it.

Here we may allude to the great value of change of air and change of scene. Not only is this important in cases where the child is located in a blind alley, cut off from the sunlight and fresh air, surrounded by filth and decay, but it has been found of almost equal service in cases where it might be supposed that there was all that wealth could procure. There are so many subtle influences working quietly, yet effectually, to undermine the health, that we cannot always understand the origin of disease or the causes of its continuance. Hence the value of a change if only to another locality. The improvement in many instances is immediate. This may be due greatly to the better air, cooler temperature, etc., and surely we must see the same effect upon children that we do it in adults. Frequently the system is roused as it were from an apathetic state, and stimulated to new efforts at recuperation. In several cases, after a child has been for several days lying without any apparent improvement, convalescence has followed a change from one room to another. I shall not attempt to explain this, but the fact is there, and is worthy of attention when the circumstances will permit of it.

This, too, holds good in the beginning of illness The old lesson so frequently given us to oppose the beginnings is equally true in regard to the health. The apparently trifling symptoms of to-day may develop into the full fledged attack of to-morrow. Hence it becomes the duty of the physician to impress upon the parents the necessity of attention to every untoward symptom. I would not have them magnify such matters, but we all can readily recall instances where serious trouble has resulted from such carelessness. The child is out of sorts, does not eat, is irritable,

refuses to play, or quickly abandons one thing for another, these actions should arouse our suspicion, and an effort should be made to ascertain the cause. A case has recently occurred to me with just such symptoms as the above. They were disregarded as the result of "crossness." On the third day convulsions set in, which continued without cessation until death closed the scene.

Symptoms such as these, while squinting, frowning in the sleep, rolling the head, vomiting and general constipation, can never be neglected with impunity. In addition, we have turning in of the thumbs which is almost invariably associated with brain trouble.

I cannot leave this point without allusion to those cases where the child halts in its walk, or returns to crawling after it has walked. Such symptoms should always arouse suspicion, lest they may be the early warnings of hip-disease or spinal affection.

We constantly find it true that the parents are too apt, after many scares, to go to the other extreme, and neglect calling the physician until serious injury has occurred.

Perhaps it would be well at the outset of our study to understand why some persons are more successful with children than others. That is, that they can with more ease approach a child and ascertain the condition. It should be remembered at the outset that children are great observers. Instinctively they know who approaches them gently, kindly. The very young child is easily startled, and it behooves the physician to act with the utmost circumspection when he makes his first visit. Let him at once seize the child and endeavor to feel its pulse, look at its tongue, or examine it in any part, and he immediately arouses a fear, a suspicion, it may be a feeling of antagonism in the child, which will take a very long time to subdue. On the contrary, he is wisest who acts as though the child was not to be the subject of inquiry. A conversation with the parent or nurse, very guarded as to the child, who should all the time object of examination in its every movement,

will generally place it more at its ease. The strange man is to it an object of curiosity; it wants to know whether he is to be feared or opproached. Like the antelope on the plain, the child is largely endowed with curiosity, and as soon as it finds there is nothing to dread—no repulsion—it is attracted, and desires to learn more of him. In this way the sensible physician speedily places himself on a pleasant footing with his little patient, and often before he knows how it has occurred he has the infant in his arms, feels its pulse, hears the action of the heart and lungs, knows the temperature, the condition of the skin, and has made a good many steps in his diagnosis.

To feel the teeth to see the tongue, to ascertain the state of the throat, are matters as readily accomplished. The finger dipped in a little sugar, if need be, can without difficulty be passed into the mouth—the small finger preferably; the condition of the gums, the presence of teeth, are noted, and then, being passed a little further back, the child gags, and the throat and mouth are quickly inspected and thus a a seemingly difficult task is performed. Who can fail to be astonished at the trouble experienced by the man who approaches a child of any age with a spatula or spoon? Couple this with a demand to "open your mouth," "put out your tongue," and the child is seized with a fear of something that is to follow which arouses its little powers of resistance. And if, finally, the physician obtains his purpose—he often fails—he has done so much harm that he usually adds to the original sickness. Should the manœuvre as above be successful he must be prepared to learn in a quick glance all that he wants about the mouth and throat—whether there be aphthæ, inflammed gums, sore throat, diphtheritic ulcers. Knowing the normal color of these parts, he can tell whether they are blanched or conjested. On the subject of sore throat, a simple action always gives us a clew. Let the child swallow a sup or more of cold water. If it swallows without hesitation drinking readily, the throat is in proper condition.

On the subject of a proper approach to a patient, I have often wondered how some men can obtain practice. It is imperative that in every way we should commend ourselves to these little people, and is it not equally so with regard to patients of older growth? Can the physician who comes to the sick-bed—say of a delicate woman—with clothing fumigated with the fumes of tobacco, perhaps even laying the cigar still smoking on the table while he talks; or, what is worse, examining the tongue or throat, while every breath is loaded with whiskey, be otherwise than offensive? It is a terrible misfortune when one has a bad breath the result of disease, yet how many of us work incessantly to acquire one!

I trust you will pardon me for this digression, but I have so thoroughly been imbued with the relief that the physician should be a scholar and a gentleman, that I can never view him otherwise without a feeling that he has aided to degrade the noblest of callings.

To return to my subject: the examination may, except in rare cases, be made a sort of play with the child. He is tickled and the laugh hurts him; a clue is obtained. He speaks or cries; the tones tell us much as to the throat and lungs. His decubitus shows whether pain prevents the proper position. In short, with a proper knowledge of the health, and a careful inspection of every movement, one often can say to the anxious mother much to encourage her, or to assure her that she has not failed in securing the services of one skilled in his profession.

Having learned as far as we may the diseased condition of our child, our next step is to remedy it, and restore it to its normal state. In attempting this let us "make haste slowly," lest in our hurry, in our eagerness to apply our remedies, we not only interfere with nature's efforts but actually add to the present trouble. Fortunately, the days of bleeding and actively physicking children have passed never to return. We no longer aid disease by reducing the child's strength to resist it.

In medicating children remember what I said at an earl
point. Ascertain the indications, and endeavor to mee
them. Is the stomach loaded with indigestible or poison
ous matter? Empty it with an emetic. The one mos
handy and efficacious will be of mustard or salt and warn
water, followed by plenty of warm water, to thoroughly
wash out the offending substance. If the case has been so
delayed that much of the mass has passed into the bowels
give a brisk purgative, and a few injections into the lower
bowel of warm water, with soap, and which may be added
castor oil.

If there is reflex irritation, with convulsive tendency, cinapisms to the spine and elsewhere should at once be employed.

If fever is present, tepid sponging almost invariably reduces the temperature, and cool acid drinks greatly aid in giving speedy and positive relieve.

Employ always the mildest remedies at first, and aid their action by quiet, rest, and diet. But do not fear when the emergency demands to use those articles which experience has shown to have power to meet such an emergency. Invariably exhibit such medicines in the minimum dose, increasing or repeating until the desired effect is obtained. Thus, as an illustration, we may take a case of convulsions, which to every one concerned is usually a source of great anxiety or excitement.

If called during the convulsion I would employ the hot bath; cold to the head, particularly in the form of ice in the bladder, thus getting all the cooling without so much of the wetting effect; broad sinapisms the whole length of the spine; and, unless the spasm quickly ceased, anæsthetics by inhalation. An interval having been secured, act according to indications. Should there be reason to regard the convulsion as the result of loaded stomach or bowels, relieve both as before mentioned, and quiet the tendency to a return by bromide or chloral, or both. I may here mention that the latter may be very usefully thrown into

the bowel, and thus avoid its unpleasant effect when administered through the mouth. Or, if there is reason to regard the spasm as a prodrome of one of the eruptive fevers, its recurrence need hardly be apprehended, and the case should be watched for other symptoms to be treated as they arise.

Perhaps in no case do we require more care in making the diagnosis. Such attacks are often the result of injuries to the brain, exposure to the sun, the result of heart-stroke, or a symptom of meningeal or cerebral congestion or inflammation. Fortunately, rest, quiet, and the treatment already mentioned, are the best that we can do until positive indications arise which demand other remedies.

Upon another point it becomes important that we should dwell for a little—the necessity of support by appropriate diet, or even by tonics, during the continuance of disease. A widely diffused belief, but one very erroneous, is that milk should be withheld from a child during fever. We have but to point to the constant suckling of a child and its necessity to prove this error. See to it that amid the care to administer medicine, that food is not neglected; that it be given in proper form and quantity, and at the proper interval. In many of the affections of children—say measles or variola—much evil is caused by the great reduction of the strength, both by reduced diet, and by reducing medicines. Where children have a predisposition to phthisis, etc., it wants but this to arouse the latent disease, and the child too often recovers from the one only to be attacked and speedily carried off by something more dangerous.

Medicines for children should always be exhibited in a palatable form. Pills, especially, should be avoided. Disguise the remedies by the employment of pleasant syrups, and make the quantity to be taken as small as may be. Frequently a pleasant remedy like the liquor potassæ citratis, with syrup of lemon or the like, will cure a moderate fever, or act as a placebo until there is more urgent need.

Perhaps my lecture would be incomplete did I not alluc to the necessity, too frequently occurring, of meeting a annoying indication. I mean the determination on tl part of so many who have the care of children that the shall take medicine because they are supposed to requi it. The child picks its nose, and has other valuable sym toms of the presence of worms, hence it must have som worm medicine. The doctor is appealed to, and if he, ver injudiciously, pooh poohs the matter, the drug store sought, and worm lozenges, teas, or other injurious trash are bought of the complaisant apothecary, and the child often rendered really ill by this administration. Where w have to do with people of sound judgment it is better t explain to them these matters at some length, and we ca generally convince them.

Unfortunately, however, every neighbor must be consulted and the doctor is either voted an ignoramus or an old fogy and the result is generally a very sick child from such offi ciousness.

Often it has been better to appear to yield, and give a placebo as above, and thus save the child from a wors fate.

In assuming the charge of a child, it should be an early duty of the physician to obtain information as to what has been the habit of the mother: if she has accustomed it to use of soothing syrups, etc. Many cases, otherwise obscure are made plain when we have obtained an honest history from those who have them in charge. Insist upon this in every case, for very many do not scruple to employ these articles for the most selfish purposes, and yet are ashamed to have it known to the physician. You can rarely hope to get such people to abandon their use, and can only employ their knowledge to enable you to employ the appro- priate treatment when disease occurs.

In these days, when the cares of maturnity are to be avoided as much as possible, and where infanticide is fre- quently preferred, we cannot ask that those who submit to

their lot and go through the pangs of labor shall be further annoyed by sleepless nights, or prevented from enjoying their regular round of pleasure merely by a crying child. And when they are presented on every side with such palatable articles which the child itself learns to cry for, it is really inhuman to expect that they will refrain from doing what every one does, even though it should cause the stunting of a child, or aid in swelling the infatile mortality.

Amid the great demorilization of the day, ours would appear almost a hopeless task. But we cannot lay it down any more than the sanitarian who so constantly finds his best efforts frustrated by greed, avarice, ignorance, and the host of obstacles always in the way of right and truth.

And now, gentlemen, in concluding, let me hope that I have not detained you to no purpose. I trust that I have sown the seed, planted some germs, that may grow and yield a harvest of good to the cause.—*Medical Bulletin.*

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## ARTICLE III.

### *Professional Etiquette.*

An editorial in the *Med. and Surgical Reporter* (Nov. 4, 1882) treats of this subject in such a commendable manner that we publish it for the benefit of the dental profession:

"We fear this is one of the lost arts among many of our profession. What it means, what are its mandates, what it obliges us to do, no one can plead ignorance of, simply because every decent and respectable man has within his innermost self that little monitor constantly advising him to do unto others as he would that they should do unto him. This, after all, is the foundation of etiquette and of justice in every profession and in every walk of life. There are some men whose moral sense seems so little developed that they fail to realize when they transgress this golden rule, and for such, one can but have pity, and charitably say, for, give them, for they know not what they do. But the

majority of our profession have sufficient intelligence, ce
cation and innate refinement to cause them to thoroug
appreciate their own littleness and meanness when th
degrade themselves to try and secure their own preferme
by belittling those whom they feel are too noble and
much above their dirty level to meet them with their o
soiled weapons. Feeling this, many conscienceless m
are ever ready to aggressively and remorselessly ass
others, and to, so as to speak, stab them in the dark, tru
in that they will never recognize their supposed disgui
and ought to be despised assailants.

There is another class of professional parasites, w
while they do not desire to injure their brethern, yet
so constituted, and possess such a small mental calib
that they cannot resist the temptation to, vulture-li
pounce down upon an imagined weakness or failing in th
confrères, and by distorting and magnifying it into gigan
proportions, hope to raise themselves by the supposed thr
downward they have given to some worthy and innoce
man. There are so many open questions in medicine, a
so many important questions upon which men of equa
great eminence entertain directly divergent views, tha
is not difficult for one so disposed to criticise almost a
statement that may be made or any action that may
performed, and to cite good authority to support his cr
cism, lacking, the while, the candor or honesty to adı
that he whom he criticises can produce equally stro
authority for his statements. Such miserably mean m
always come to grief in the long run, for be it said, to
credit of human nature, man, on the whole, realizes t
honesty is the best policy; and though water for a ti
may be forced up grade, yet when left to itself mu
according to nature's inevitable laws, seek its level;
these men are ultimately detected in their nefario
attempts at self-advancement, and are forced, by public a
private opinion, to occupy that low level to which all kin
of dregs, animal and vegetable, naturally belong.

So, then, it is pleasing to the honesty of every right-minded man when such despicable men, (for we can call them by no more gentle name) are exposed. Such has been recently done in England, in the case of two professional back-biters. In the one case a surgeon was engaged to attend a case of compound fracture. When the man was discharged, cured, the physician presented a bill for sixty dollars. Instead of paying it, the patient *acting under the advice of another physician*, instituted a suit for damages, on the ground of malpractice, basing his claim on "forgetfulness or ignorance of all the rules of art, and in particular on the employment of perchloride of iron to arrest hemorrhage." A committee of experts, composed of medical men, appointed by the court, concluded in favor of the surgeon; the man offered to pay the bill and withdraw his suit; to this the surgeon objected, when it was ruled by the court that the man should pay the original bill, all costs and one hundred dollars damages to the surgeon. In the second case both plaintiff and defendant were medical men. An illiterate man was sent to a certain city, with a card from a doctor in a neighboring town, recommending him to the care of Dr. A. An omnibus driver, by mistake, took him to the house of Dr. B, who kept both card and patient. Dr. A heard of the occurrence, and meeting Dr. B on the street, upbraided him with his unprofessional conduct, and, called him offensive names. B, seeing that his position was compromised, summoned A before the courts, where the tables were entirely turned; B, was condemned to pay A $1000, damages, and an appeal resulted in a confirmation of the judgment.

Such cases should delight every honest man and every reputable practitioner should constitute himself a detective to bring to the bar of justice and purge from the list and companionship of respectable physicians, all who endeavor to advance themselves by libeling honest and capable members of our profession.

It is hard enough for a man to succeed in this world of struggling, even though he receives fair treatment from all,

but when the miserable back-biter comes in to injure him his lot is truly deplorable. So then let us have cone with unseemingly contention in our great profession."

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# EDITORIAL, ETC.

*Dental Colleges.*—Dr. George Watt, the able editor of the *Ohio State Journal of Dental Science* in an editorial with the above title, very truly remarks that " formerly there were those who willingly made great sacrifices as teachers in the dental colleges, believing that, in the state of the profession at that time, it was their duty to do so without financial reward. But now in the advanced condition of the profession, such inducements do not exist, and similar sacrifices are not to be expected. The teachers must now receive financial compensation for their labors. The schools not endowed must hold out strong inducements to attract students. Since they supply the funds it is necessary to matriculate them without requiring them to understand even the common branches of an English education. Ichabod might be inscribed on the doors of any one of these colleges, not connected with Universities, that would not cheerfully receive all who apply, and graduate them without much regard to their attainments. Students would go elsewhere, and the colleges would die of inanition. As most dental students when matriculated, are wanting the mental training to make them apt scholars, and few of them have much know

edge of the studies to be pursued, the tuition in our dental colleges is too short. The average term of those, not departments of Universities, is about nineteen weeks. Deducting two weeks to get the pupils well at their studies at the commencement of the terms, two weeks for the holidays, and one week for the examinations at the end of each term, leaves fourteen weeks for study. It is not to be presumed that *the* students will devote much time to study during the vacations,"

He then asks "are twenty-eight weeks, with all the advantages a college can afford, a sufficient time to require a knowledge of anatomy and oral surgery with dissections, physiology, histology, pathology, therapeutics, chemistry, and operative and mechanical dentistry? The result is that most of the students in the dental schools require a smattering of what is taught, and are usually graduated without much attention given to the evidences of their attainments, shown by their examinations. Is this the proper way to elevate and maintain the standing of a profession recognized as learned, and a branch of that engaged in the practice of the healing art?" He further states "there is little probability that dental schools not connected with Universities, would agree on and abide by any rule requiring a good English education of those received as pupils, and extend the time of pupilege to enable them to gain the requisite knowledge of the subjects taught. Were all dental colleges department of Universities, these difficulties might be more readily avoided. supported from the common fund they would be free from the strong inducements to receive students without preliminary examination, and grant diplomas to those not well qualified."

As Dr. Watt is well known to have been connected for many years with the faculty of a dental school, and everywhere acknowledged as one of the most enlightened members of the dental profession, his opinions on the subject of dental education are worthy of the highest consideration.

# BIBLIOGRAPHICAL.

*Coleman's Dental Surgery and Pathology*. By Alfred Coleman, L. R. C. P. Dental Lecturer St. Bartholomeus Hospital, etc. etc. etc.

Thoroughly revised and adapted to the use of American Students and Practioners. By Thos. Stellwagen M., A., M., D., D. D. S., Professor of Physiology in Philadelphia Dental College; Publishers, Henry C. Leas' Son & Co., Philadelphia, 1882.

The Editor of this work deserves great credit for the labor he has bestowed upon it to adapt it to the American Student of Dentistry. One hundred and twelve additional illustrations add to the value of the work, together with the important additions of text covering about one hundred pages. In a work of such a size, many subjects are necessarily treated in a brief manner, but the descriptions are lucid and of a character which makes it an important addition to the text books of dental science. The chapter on irregularities while not as voluminous as in other works, contains much valuable instruction, and a description of the latest appliances which have been suggested for the correction of deviating teeth. The chapter on methods of crowning teeth is also a valuable one, the recent improvements, being fully described.

The appearance and style in which this work is published is worthy of the reputation of the well known Publishers.

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*Dental Metallurgy*. A manual for the use of Dental Students. By Chas. J. Essig, M. D., D. D. S., Professor ot Mechan-

ical Dentistry and Metallurgy in the Dental Department of the University of Pennsylvania. Publishers: S. S. White Dental Manufacturing Company, Philadelphia, 1882.

This is another valuable contribution to the text books of the profession, and contains information of the greatest importance to the dental student and practitioner. Dr. Essig has compiled a complete and readily comprehended description of the origin, nature properties and alloys of the greater number of the metals employed in dental practice, and given many valuable formulæ. We notice however an omission of descriptions of bismuth and antimony, although the formulæ for fusible metals, type metals, &c, are given.

The use of zinc counter-dies in connection with zinc dies, is highly recommended in the process of swaging plates, and much interesting matter, the result of considerable research is presented in a condensed form, very well adapted to the needs of dental students.

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*Quiz Compends No.* 1. *Anatomy. Questions on Human Anatomy.* By Saml. O. L. Potter, M. A., M. D., with sixty-three illustrations. Publishers: P. Blakiston, Son & Co., Philadelphia, 1882.

This work contains a series of questions and answers, comprising a concise description of the bones, articulations, muscles, arteries, veins, absorbents, and nerves of the human body, including the heart and brain as essential parts of the circulating and nervous systems respectively.

It is intended for the use of medical students, and must prove to be a valuable assistant in preparing for examinations. The text closely follows Gray, and the Latin names universally used by anatomists have been retained. Its small size, and flexible cover make it convenient for a pocket reference, and the style of its publication is commendable.

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*The Physicians' Visiting List for* 1883. P. Blakiston, Son, & Co. Publishers, Philadelphia:

For years past we have annually noticed this excellent publication which is as well adapted to the dental practititioner as

to the medical, for an engagement book. The present edition contains the usual contents and affords every facility for the daily record of patients. The posological table which is very complete, is of great value, giving the doses of remedies expressed in terms of apothecaries weights and measures together with the metric terms. The French decimal system of weights and measures is fully explained.

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*The Independent Practitioner.* We learn that W. C. Barrett M. D., D. D. S., of Buffalo, N. Y. has accepted the entire charge of the dental department of this publication ; and that all dental matter is to be sent to him. We congratulate the proprietor of the Practitioner in securing the services of so able an editor and predict for it increasing prosperity, interest and usefulness

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# MONTHLY SUMMARY.

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*The Speed of Thought*—We have several times given the readers of the *Journal* a report of what has been done by scientists to determine the rate at which nervous influence is transmitted through the telegraphic system of our bodies. Some recent investigations on the subject are thus summed up in the *American Journal of Arts and Sciences :*

Sensations are transmitted to the brain at a rapidity of about 180 ft. per second, or at one fifth the rate of sound ; and this is nearly the same in all individuals.

The brain requires one-tenth of a second to transmit its orders to the nerves which preside over voluntary motion; but this amount varies much in different individuals, and in the same individual at different times, according to the disposition or condition at the time, and is more regular, the more sustained the attention.

The time required to transmit an order to the muscles by the motor nerves is nearly the same as that required by the nerves of sensation to pass a sensation; moreover, it passes nearly one-hundredth of a second before the muscles are put in motion.

The whole operation requires one and one-fourth to two-tenths of a second. Consequently, when we speak of an active, ardent, mind, or of one that is slow, cold or apathetic. it is not a mere figure of rhetoric, but an absolute and certain fact that such a distinction, with varying graduations, really exists.

The method by which these nerve motions are measured is thus described:—

If a cylinder divided into 360° be caused to rotate 1000 times in a second, it is evident that the passage of one of those degrees before a given point is equal to the 1,360,000th part of a second; this may be divided by a microscope, so that a period of time equallying the ten millionth, or even the one hundred millionth, part of a second may be measured. By this arrangement it is possible to measure the rate of nervous impulse. Suppose an electric shock be given to the arm; it produces a sensation and a contraction of the muscles; then, by noting the interval of time between the shock and the contraction, of the muscles; the time occupied by the action of the brain to produce the contraction, however quick, will be ascertained. By trying this experiment on various parts of the body, the amount of sensibility of the different leading muscles maybe determined.—*Boston Journal of Chemistry.*

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*The Use of Iodiform in the Dental Practice.*—It has been the aim of many thinking dentists to discover some remedy to save exposed pulps, in order to keep up the circulation and consequent nutrition of the tooth.

Thirty years ago Kœker was the first to recommend the saving of pulps when exposed, which has ever since been practiced

with more or less success. Stimulated by the reports of Mosetig, in reference to the antiseptic and change-producing property of the iodiform, and encouraged by Underwood's article in regard to the power of iodiform to avert suppuration, etc., I concluded to give it a fair trial as to its virtue in the preservation of exposed nerves, and have, so far, been successful in nineteen cases of exposed pulps to save the teeth without destroying the nerve.

I cover the exposed nerve with a paste of pure iodiform and glycerine mixed in a small mortar, covering the paste with a pellet of cotton. and close the cavity with gutta-perch. taking care not to pack the latter so tight as to produce pressure upon the nerve. The further treatment, capping the filling of the tooth as well as the use of iodiform in the treatment of teeth where the nerve has been killed or dead, I will report in a dental journal some future time, and will only add here that I failed in three cases to save the tooth which was extracted at the request of the patient, after I made one application of the iodiform.

On microscopic examination of the nerve (longitudinal section) I found the whole field covered with new cells, showing an inflammatory condition of the organ.

The assertion that iodiform, like arsenious acid, is capable of destroying the vitality of the nerve is not confirmed, and has to be a priori precluded, when we consider in what large quantities this remedy is put upon and into wounds of all kinds, and how much mischief it would produce if such an assertion was correct.

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*Excision of Superior Maxillary and Inferior Dental Nerves, for Neuralgia.*—"The fact that a new connecting medium sufficient to enable a nerve to perform its functions can be developed to the extent of an inch or more has been sufficiently attested. Any resection, therefore, which would embrace a less portion of nerve would in all probability be of only temporary benefit, unless the period of relief gained thereby would permit of such constitutional recuperation as would withstand any future attacks.

"My experience in the operation of resection for neuralgia has been extremely limited, but the success attending my efforts

has been so satisfactory that I venture to offer it as an inducement for a more extended application of this method of relief"

A severe case of neuralgia coming under his care, it was decided to resect a portion of the inferior dental nerve. The disc of bone removed by the trephine failed to expose the nerve, and the patient bearing ether badly, it was decided to postpone further operative interference. Subsequently, both the superior maxillary and inferior dental nerves were excised.

The continuance of the pain for a few days after the operations and its return for a short time, seven months later, cannot well be accounted for. The clinical features of the case embraced all the symptoms described by Trosseau as characteristic of epileptiform neuralgia, which he believed to be an expression of true epilepsy, a view scarcely confirmed by the history narrated. Entire and permanent immunity from pain, return of appetite, ability to take solid food and comfortable sleep, were secured by the operations.—*Dr. W. Wallace in Pittsburg Med. Journal.*

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*Tetanus from a Carious Tooth.*—A very remarkable case of fatal tetanus, ascribed to the irritation of a carious tooth, was reported some time back in one of the West of England journals. The patient was a shoemaker, residing at Bridgewater, who had enjoyed excellent health until he was seized with violent pain in the side of his head. He was treated in the first instance by a chemist for neuralgia, but the symptoms becoming aggravated Mr. Kemmis, a medical practitioner, was called in, He found the patient insensible, with his jaw locked and immovable. Treatment, however was unavailing; the man remained insensible, and died in a few hours. At the inquest Mr. Kemmis stated it as his opinion that death was due to tetanus brought about by a decayed tooth, and he characterized the case as a most extraordinary one—a statement with which every one will agree. Simple trismus from some form of dental irritation, generally the difficult eruption of wisdom teeth, is not a very rare phenomenon, and cases of it will be found recorded in several of our back numbers. But general and fatal tetanus from a similar cause is happily of extremely rare occurrence,

Mr. Tomes has recorded a case which was apparently due to the operation of pivoting, and Wedl has mentioned one in which tetanus followed the extraction of a tooth. In Mr. Tomes' case, as in the one the particulars of which are given above, death occurred very soon after the first appearance of muscular spasm.

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*Therapeutics and Physiology.*—Dr. Geo. F Yeo concludes an address in the *Lancet* on "Experimental Physiology and Practical Medicine," as follows ;—

Rational therapeutics must grow out of physiological knowledge, as surely as a plant is the outgrowth of its roots. As the remote rootlets are the exact parts which are all important for the nutrition of the plant, so experiment feeds physiology, and thereby nourishes the art of medical practice. It would appear silly to ask to what rootlet any single fruit or flower on a widely-spreading tree owed its existence or nutrition, and so it is idle to expect that each, or even any, therapeutical agent or method of diagnosis should be traced to the definite experimental discoveries that may have led to its adoption or use. As the branches of our medical tree spread wider and wider, and its diagnostic flowers and therapeutic fruits become more numerous, we find that its physiological roots go deeper and deeper, in search of pabulum, and the experimental rootlets become still further removed from the more obviously useful and prolific part of the plant.

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*Changes in the Secretion of Milk under Influence of Medicines.*—A few numbers ago the *Medical and Surgical Reporter* mentioned some experiments recently made to determine the influence certain medicines may or may not exert on the composition of the milk, when the drugs are given to the nursing mother. Dr. M. Stumpf has now instituted still more researches in this direction.

The investigations were mainly made upon a young goat, the feeding of which was carefully regulated. The influence of iodide of potash, ethylalcohol, lead, salicylic acid, morphia and pilocarpia were employed, and their effect noted concerning quality and quantity of milk: the transfer of these drugs to

the milk was also specially examined into. The results were as follows:—

1. Iodide of potash diminishes, salicylic acid augments (probably) the quantity of milk; alcohol, morphia and lead produce no change in the quantity of the milk, while pilocarpia does not enhance the secretion.

2. Salicylic acid augments the percentage of sugar in the milk, alcohol the fatty portion; lead, morphia and pilocarpia leave the milk unchanged in this respect, while iodide of potash disturbs the function of the mammary gland and causes a change of all the parts of the milk.

3. Iodine, united to casein is transferred to the milk, but the quantity of the drug is subject to individual peculiarities, changing in different animals of the same species. In women the iodine disappears again in the milk as soon at its administration ceases; in herbivorous animals the medicine is found for some time after cessation of introducing the drug into the system, still in the milk.

4. Alcohol is not transferred; of lead, salicylic acid and the other remedies named, only traces were found.—*Med. and Surg. Reporter.*

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*The Teeth in Diabetes.*—Dr. Magitot has after an examination of many diabetics, come to the following conclusions: First: Examination of the mouth of diabetics, furnishes a constant symptom of the disease. Second: This symptom is a lesion of the alveolar border which may be designated as an alveolar osteo-periostitis. Third: This manifestation appears at the outset of the disease, persists during its course and can, in consequence, be considered a pathognomonic symptom. Fourth: This alveolar affection. considered as a symptom of diabetes, presents three periods. Its first period is that of simple deviation of the teeth. Its second period is that of loosening of the teeth and alveolar catarrh. Each of these periods is in relation to the phase of the constitutional disease. The third period, that of the falling out of the teeth, corresponds to a more advanced state of glycosuria. Beside this last symptom they may occur, if the patient lives long enough, an osseous resorption which may, or may not, be consecutive to a gangrene of the gums. The appearance of this latter complication is evidence of a criti-

cal stage of the disease, as it ordinarily ushers in its fatal te mination. The value, as a symptom, of the first stage of de tal changes, remains to be determined. It must be obviou however, that it can only occur in the more chronic forms glycosuric diabetes.—*Exchange.*

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*Preparations of Aconite*—Dr. Squibb, in his *Ephemeris*, writ concerning the value of the different preparations of aconi and its alkaloid. He concludes that the fluid extract of th root is the best preparation for internal use. The dose is on minim, which may be given every three hours, or oftener needed. For external use, he says, there is probably no for better or more convenient than an oleate of aconita, made b dissolving two grains, or 130 milligrammes in 98 grains of olei acid. A fluid ounce of oleic acid, weighing 412 grains, require 8.25 grains of aconitia to make a 2 per cent. solution. Eac minim of this oleate contains about 1.060 of a grain, and thi quantity applied locally and repeated according to circumsta ces, should be an efficient dosage, and should in a short tim produce constitutional effects by its absorption. It should b applied to the surface by the cork of the vial, or by some no absorbent, without friction, and about the head and face it need no covering; great care must be taken that it does not get int the eye. In using it around the eyes this caution must neve be forgotten. If applied under the clothing it should be cover with oiled silk or rubber tissue. Local neuralgias are muc better reached by the dermic or epidermic method of treatmen —*Med. Record.*

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*Lancing the Gums of Children.*—It is very proper to lan the gums of children, when the gums are swollen, and eith red from some inflammation, or *white* from pressure of a too *coming.*

The operator should *know* whether a tooth is pressing on th gum, and trying to make its way out. In this case *cut down the new tooth,* until it is felt under the lancet. For incisors an cuspids, a straight line cut. For molars, a cross-cut.

How, *not* to do it: Not with a child sitting up, in your la or any one's lap.

*How* to do it: Let the operator and "nurse" sit close together, facing each other. The child is laid down, face upwards; the head in the operator's lap, the feet in the "nurse's" lap. The nurse holds the limbs of the child, quietly, so that it may not interfere.

With the left hand the operator takes the jaw between his fingers and slowly and firmly does the cutting.

There is no *false* cut, The child is still.—*Dr. Chase in Mo. Dent. Journal.*

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*Toothless Persons*—Dr. Kilpatrick, of Navasota, Texas, thus writes to *Gaillard's Medical Journal*: "In your columns I notice the case of a man who died eighty years old, and who *never* had teeth. In corrobation of this I say I know a rough carpenter named Richardson, living in Catahoula Parish, La., who never had teeth. He was a dark skinned man of bilious temperament, very seldom sick, and at that time, 1854–60, was about fifty years old. I also know a lady here in this town who had never had teeth. She was from South Carolina. She was of ordinary size, fair complection, nervous temperament, intelligent, parents wealthy, married and the mother of three children. Her parents were near relations, and theirs were also, and I attributed the oddity to that. She wore artificial teeth after being grown. She also married her cousin. She has been dead about twelve years.

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*Varnish Your Cavities*—Dr. Chase in the *Mo. Dent. Journal* says:

Cavities to be filled with either gold or other metals, deserve to be varnished. It seals up the open tuble. It covers the dental surface with a non conducting material. It cuts off electrical action between the dentine and filling. It in a great measure prevents chemical action caused by leaky plugs. It prevents oxides of metals from penetrating and staining dentos.

Dry the cavity thoroughly, then wipe it with sandarach varnish. Wipe it again nearly dry, and put in the filling. I say *nearly* dry, for the water present in the dentos will draw the alcohol from the varnish and leave only a dry gum on the surface of the cavity walls.

I speak from an experience of many years and am sure tha this varnishing should never be omitted.

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*To Gild Without a Battery.*—Small articles like rings, but tons, etc., may be gilded as follows: Digest a small fragmen of gold with about ten times its weight of mercury until it i dissolved, shake the amalgam together in a bottle, and afte cleansing the articles coat them uniformly with the amalgam Then expose them on an iron tray heated to low redness for a few minutes—the mercury volatizes, leaving the gold attached as a thin coating to the articles. The heating should be done in a stove, so that the poisonous mercurial fumes may pass up the chimney.—*Scientific American.*

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*Excision of the Tongue.*—Mr. Croly, of Dublin, performs the operation for cancer of the tongue, even when the disease is situated in the anterior portion of the organ. His first ligatures each lingual artery close to the hyoid bone, through a curved incision, reaching from the symphysis down to the hyoid bone, and up and back to the angle of the jaw. Through these incisions he withdraws the tongue, as in Regnoli's operation, and removes the requisite amount of it by the benzoline cautery. Lastly, he divides the gustatory nerve where it lies along the inner border of the jawbone.

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*Swallowing Artificial Teeth.*—The London *Lancet* reports a ase of swallowing artificial teeth by a man subject to epileptic fits. A partial denture was swallowed, and expelled *per rectum* twenty-four hours afterwards. The patient, after cleaning the plate, placed it *in situ*, and all was was well for nine years when the same plate took another visit through the pylorus, but was thirty-one days *en route* this time.

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## ARTICLE I.

### *Drs. Watt and Taft on the First Permanent Molars.*

[Proceedings of the Ohio State Dental Society.]

Dr. Watt; The question comes up with every young mother, and I guess every old mother, what shall be done with the baby; and in general we just simply say, nurse it. The baby ought to be taken care of, and I don't know that we can say anything better in regard to the six year molars. Just how the baby is to be nursed, whether to be fed on goat's milk, or cow's milk, or tug at its mother and make its honest natural living, depends on the circumstances, whether the mother can support it that way or not—whether her mammary glands secrete a health-giving fluid—whether the state of her constitution will tolerate this. Whatever, though, is to be best for the baby and all others concerned, is to be done. So these six year molars ought to be taken care of. There is not much doubt that our Heavenly Father intended that they should stay there until the owner of them shall die of old age. I think you may dissect the human body from end to end, you may make a microscopic investigation, and you can't find any preparations for death. Everything in a healthy constitution—every organ, if it is healthy—points to life, and not to death,

And the first permanent molars—the six year molars, as they are sometimes called—are no exception to the rule. They are made to last until natural death ensues from simply the running down of the clock; and, therefore, they are to be treated accordingly,—that is, provided their constitution is normal. Sometimes, however, in one sense there is no physiology at all, but all is pathology, for man is a fallen being; therefore, the first permanent molars often suffer. It is a great misfortune that the child is often shut up in confined rooms, and an unhealthy atmosphere, at the time these teeth are being developed, and they come with a feeble, defective structure, and hence they decay readily and easily. Another trouble, however, is that about the time these teeth are fairly through the gum, and before they have had time to consolidate, the child is sent into school, and there is kept for about eight hours a day, and must not move—it must be in dread; and it is not one time in ten that you can pass through a primary school and, with the eyes of a physician, see one healthy child in the school room of thirty to fifty children. It is just as much as a bargain if the public schools, as now conducted, escape being a nuisance. I am inclined rather to think that they are a nuisance, with all the glory that we have attached to them, and our talk about "free education." Children are forced into unnatural conditions. Now, that is not a good way to treat these first molars. When I get to be the autocrat of all the Americas, a child that is under eight years shall not be shut up in school at all, and it shall not be shut up more than a half hour to an hour at a time, varying with the constitution, if eight; and the teacher that assigns lessons that have to be studied at home, and then simply recited in the school room—to be studied at home, when the child ought to feel as free as a colt turned out on pasture, or as a lamb by the still waters—shall be summarily dealt with. The child is in dread, is weighed down with the consciousness that here is a series of long lessons. The child of eight years old is usually taxed

further, in regard to brainwork, than the student of twenty-five in the university. This is not doing the first molars any good. The result is that the secretions become depraved, even if the little child, with an ammoniacal degeneration of tissue. If you desire a friendly kiss from even a small child, you will find the breath loaded with ammoniacal putrefaction. It does not smell much like spirits of hartshorn; hence, people don't think it is ammonia. They forget that the ammonia is combined, under such circumstances, with phosphuretted hydrogen. The brain and nervous system of the child are actually burned out. Hence, we find a far more offensive smell than ammonia would itself give. And we find that condition in the child because it is deprived of fresh air; it is loaded with anxious care; it has no hours that it feels free from the heavy responsibility, and no time at which it is allowed to feel like a child. The consequence is we find all the secretions depraved. When the mouth is in this condition, these teeth, being soft, corrode. And parents, inasmuch as these teeth have made their appearance before the incisors are shed, think they are temporary teeth. And if there is one thing that parents must be far more generally taught than another, it is that these are permanent teeth, and must be looked after. The secretions of the mouth must be kept healthy. And, in order to do this, the child must be treated as a rational human being.

But there are exceptions to all of this. Sometimes, on account of our race being wonderfully mixed, the child may inherit its jaws from one race and its teeth from another. The teeth are secretions. The secretory organs are more likely to be inherited from the mother than the father. The anatomical structure of the head and the spinal cord are more liable to be inherited from the father. You can always remember this if you look at the mule; its head and back are almost like its father's, while its size and the secretory organs are like those of the mother. So the child, which is more likely to have the head of the father, often

takes the teeth from the mother. If the mother happens to be of a race or nationality that usually has large teeth, and the father happens to be one of the finer featured races, the result will be greater disproportion. Now, then, if these teeth are found decayed, if there is not room for all the teeth, and those teeth are so depraved that they can not be retained permanently, then remove all four of them; especially if the patient is a little girl, and you don't want her beauty marred, have them all taken out at one time. Sometimes, by removing these, there is room for the teeth to place themselves in their proper arch, and when they have room thus to make their appearance, they are to be preserved by appropriate filling in time and the proper protective treatment, which means the general health of the child.

I am sorry to say that I think there is far too much disposition in the profession to sacrifice these teeth recklessly. If they are reasonably good and there is room for them, they ought to be preserved. It is a great misfortune to lose them. They have very much to do with the nutrition of the child—more between six and nine years of age than any other organs in the mouth. They are needed for purposes of mastication. Then they have more to do in prepreserving the beauty of the features than any other teeth in the mouth, unless it be the cuspids—I mean in preserving the features, as they will show when the mouth is closed. As a general rule, where one of them has to be sacrificed for lack of room, it is better to remove all. If all four have to be removed, it need not at all be done at one sitting. I find it is usually too much of a shock for the child. My usual practice is, if I have to begin the sacrifice, to explain it to the parents and to the child too, and you will generally find the child will consent as readily as the parents will. Children at that age, little girls especially, seem to instinctively understand that they are intended to be good-looking, and that their features need to be preserved. Now, these are very scattered remarks, and I know that

many members of the Society will say, "Pshaw! I can make a better speech than that myself," and what I got up for was to induce them to do it.

Dr. J. Taft: Mr. President, Dr. Watt has made some very good suggestions in regard to the care of the first permanent molars. Perhaps this question might have been put in another form and be a little more appropriate, as, "What shall be done for the First Permanent Molar Teeth?" However, that is not a special matter. The remarks of Dr. Watt are mainly upon the question in that form, "What shall be done in behalf of the First Permanent Molars?" And here, in reference to the nomenclature, "first permanent molar" is the better name to apply to these teeth. The term "six year molars" is an awkward expression, and one that should be discarded. It is unfortunate to use a number of terms or words meaning the same thing. Let us select the best term, and then use it and discard those that are not so good.

Now, what shall be done for the welfare of the first permanent molars? We must begin where Dr. Watt began his speech—at the early, or formation stage of the tooth, or begin with the mother. Perhaps the treatment of the mother should have reference to this, and to the welfare of all the teeth, prior to the birth of the child. But, then, as dentists ordinarily find them in the mouth, they are all erupted, and what shall be done with them then? During the life of the child, before the appearance, of these teeth, reference can be had to the welfare of the teeth, these as well as the rest, in the treatment that shall be given to the child, in its protection from disease-prod u g influences that are so common, and to which all persons are more or less subject. The hygienic regulations under which the child should be brought, should be modified very much, indeed. In many respects children are subject to disease-producing influences in a very marked degree. This is clearly shown by the large amount of infant mortality Why is it that the young of other animals do not have this

proportion of death? Why is it that the rule is, in the great majority of cases, that the young of other animals, which we would suppose are not cared for as those of the human kind ought to be, exhibit so great a disparity in the matter of mortality? Forty per cent., perhaps, of the human family die prior to the age of five years, showing that there is something radically wrong in the care, in the exercises of hygienic rules and regulations for their welfare —giving the best nutrition, giving them the best support, surrounding them with the best circumstances, warding off the influences that produce disease; there is something radically wrong in all these particulars. During the formation and development of the teeth children are subjected to diseases of various kinds. Consequently the teeth will certainly undergo deterioration; they will not be developed as perfectly as they should be. Take, for example, the enamel. The organ may be atrophied for want of proper nutrition, and then it will be defective in one or more particulars, and in some instances the organ will be starved, and contraction will take place. Therefore, there is no union at the edges of the enamel in the fissures, and there will be those open points or fissures that we frequently find in the molar teeth. This occurs more frequently on first molars; these fissures are more marked ordinarily in the first molars and in the bicuspids than in any other teeth in the mouth, showing that there was interference at the time of formation of the organs that did not afterward occur. There will be exceptions, of course.

Then, again, defects in the enamel may be manifested in another direction. By want of proper nutrition the enamel may not receive its due amount of material for solidifying or calcification, and that will manifest itself in various ways —either in the pits and grooves, or the imperfect territories in the enamel, which will be shown by the whitened condition, by the change in the appearance of the enamel, defective spots. Sometimes the enamel is defective throughout. Now, the same thing may occur, without any appre-

ciable reason, in the formation of the dentine. Reference should be had to the perfection of the teeth in the nutrition of the child during the time of the growth and development. Though it may be good in all the respects to which I have referred, subsequent privation of nutrition will prevent the due solidification of the teeth. The tooth, at the time of eruption, has nothing like as much calcareous material in it as it ultimately receives, or will receive under proper nutrition. This, then, is a matter to which attention should be given through the growing period of the child; not only while the tooth-germ is forming, but while the tooth is being developed and growing, and afterward as well.

The period at which these teeth come is a very unfavorable one for the best interests and the welfare of the teeth. They come at a period when the child is susceptible to a great many disturbances, and many perturbations of health occur during this period. It is a time of life that is subject to irritability, and special susceptibility to morbific influences that surround and attach to it; and it is a vulnerable time in which, at any time, disease is liable to fasten upon this organ. Then, these teeth are erupted at a period when the mouth is oftentimes in a state of marked irritation. It is at the time of the throwing off of the temporary teeth, and ordinarily under the best circumstances, there will be somewhat of irritation in the mouth during this period; and in so far as this condition exists are the permanent molars likely to suffer for want of exercise—for want of due use in mastication. The contiguous teeth are loosened, and there is irritation of the gum, and a vigorous use of them would occasion pain, and the inclination of the child, at this time, is to protect the teeth from irritation, and to avoid the use of them in mastication; and the result is that about these molars, accumulations are generally found, and especially unless attention is given to the matter by the parent, or by some one having the child in charge. There will be more or less accumulations of vitiated matter about.

the teeth. That will be the rule with the first permanent molars, for a year or two after their eruption, a circumstance that directly favors their decay. The child should be stimulated or induced to use these teeth in mastication, from the time they make their appearance, sufficient to prevent the accumulation of foreign substances upon them. When we consider the amount of vitiated material and debris of one kind and another—agglutined mucous decomposing material, and epithelial scales that cover them during the year or two following their eruption, the only wonder is that they escape as well as they do.

There is one fortunate circumstance in connection with this condition in the mouth, that during the time of this irritation there will be a large inflow of saliva, and a dilution of the deleterious agents. But this is not sufficient, in most cases, to neutralize or overcome the vitiated product and materials in the mouth that operate upon these teeth.

Then, again, the temporary molars are very frequently decayed upon their posterior proximate surfaces, in contact with the anterior proximate surfaces of the permanent molars, holding in contact with the latter, material undergoing decomposition, out of which the materials that will produce decay are formed. They operate, then, upon the anterior surface of the permanent molars. This is a very common point of decay. And in order to avoid or prevent that, special attention should be given to the teeth in this respect. And when there is decay upon the posterior surface of the temporary molar, it should be cut away. The diamond disk is a very good instrument for this purpose, as, with it, the separation can be very readily and easily made without annoyance to the child; whereas, the use of the file would be objectionable, and with many children it would be almost impossible so make such separation with the file. Very scrupulous search should almost be made for decay in the anterior side of the permanent molar, and if there is incip ient decay, let it be at once removed, and let the very best be done in the eradication of decayed points, and a com

plete, thorough polishing of the surface, and in the future let them be kept as clean as possible. If there is a point on the crown of these teeth where decay is beginning, that should be filled at once. Taking any ordinary case, by such care the first permanent molars may be, as it seems to me, preserved. But, unfortunately, a large portion of these teeth are allowed to be destroyed before particular attention is given to them.

And, then, from the time of their eruption, they should be well and thoroughly used, which will accomplish two or three things: The friction keeps the teeth free from the deposit to which I referred, and the pressure exercised upon them gives strength to the periosteal attachment, and stimulates the circulation about the roots and into the pulp, and, of course, the bringing into the part an abundant supply of the nutrient material which it demands. In this way the tooth will be better conserved than if it was not properly exercised. This exercise can be given to the teeth in the use of such food as will require sufficient pressure upon the teeth, and sufficient exercise.

Sometimes, when one of these teeth is taken away, the second and third molars will come in and fill up the space, and there will be no loss; but in the great majority of cases this does not occur, to the complete filling up of the space, that has been left by the removal of the first molar, At the age of seventeen, I had two first molars removed, and the spaces stand there to-day as large as when the teeth were taken away; and the teeth did not move forward, or the other teeth go backward to fill up the space, and it has been a very great annoyance from that time to this. But sometimes the second molar will move forward, as a whole, and occupy the space of the first, to a considerable extent, and occasionally almost entirely, but these are exceptional cases. Often the second permanent molar will tip forward, instead of moving forward in an upright position, and then what is the result? You have the posterior corner of the tooth thrown up for occlusion with the opposing tooth

above, and a large portion of the surface of the tooth is not used for breaking up the food, and there is imperfect mastication and insalivation of the food. Sometimes the bicuspid tips backward a little, and the same disturbance arises —the right occlusion for thorough mastication is destroyed. In the proper arrangement of these teeth for mastication they come together like the faces of millstones, and they operate, face to face, one upon the other. They are not thrown together, here a corner and there a corner, touching only at a few points.

It is said that the other teeth are preserved by the early removal of these teeth. Well, that depends very much upon circumstances. If proper care is given to the mouth, the other teeth will not suffer because these are retained. It is not necessary for us to cut off one of our fingers in order to save the others. No more is it necessary, recklessly, to take away one tooth for the welfare of the other. I know that there may be cases of irregularity when it is necessary to do this. I am speaking now of those cases where the development and arrangement of the teeth are entirely normal. There is no occasion for the removal of the first permanent molars to preserve the other teeth, if the proper care is exercised on their behalf. I regard it as a very great misfortune, indeed, to sacrifice first permanent molars, and I think every effort should be made for their preservation and their retention in the mouth during life.

Dr. G. W. Keely: I would like to ask, if the patient was eight or ten years old, and the four first molars were badly decayed and the pulps exposed, what would you do with them.

Dr. J. Taft. Well, I don't know what I would do exactly; yet I would treat them and endeavor to save them just as earnestly as I would if the person were twenty-five years old. If the person was well developed, and in good condition otherwise, I should certainly endeavor to save the teeth. If I inferred from the general make-up that there would be a breach that would never be repaired in any way,

I should regard it as a very important matter to preserve those teeth as long as possible. The observing dentist will form an opinion when he sees the patient. If it is one of those strong, fixed, unyielding, firm organizations, you will not expect the teeth to come in and fill up the space. In a case of that character I should preserve the teeth as much as I would at any other period of life, just as long as I could keep them free from disease and discomfort to the patient. By the way, I think the material with which those teeth are filled should be carefully selected. I do not think that in every case it is best to fill those teeth at once with gold. Say, from six to seven or eight years of age I should prefer tinfoil ; and perhaps, if the teeth were very sensitive, I might use some more temporary material than that. The teeth generally decay more readily at from seven to eight years of age. I have many times filled teeth with the expectation that the operation would only be temporary, and have found, in many such instances, that the teeth so filled have remained for years and years. There are teeth in this room, now, that I filled twenty-five or twenty-eight years ago, with tin-foil, thinking that they would not last a great while ; and in years afterwards they were found to be no further decayed, and the tin fillings were removed, the teeth filled with gold and the teeth are to-day far better than when they were filled with tin in the first place.

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## ARTICLE II.

### *Caries and Necrosis of the Maxillary Bones.*

BY TRUMAN W. BROPHY, M. D., D. D. S., CHICAGO.

[Read before Illinois State Dental Society, May, 1882]

Caries and necrosis of bone both result from the removal or death of the periosteum, or from the separation of the periosteum from the bone by means of intervening pus.

These conditions, however, frequently have their origin in ostitis.

The exciting causes of the diseases under consideration are various: confined dentes sapientiæ, for want of room, salivary calculus, traumatism, heavy malleting in filling the teeth of young patients, and other agents capable of producing ostitis or periostitis; but of all the causes of diseases of the maxillary bones, the presence of pulpless teeth and fangs of teeth is far the most prevalent. From such teeth and roots, indeed originate more diseases of the bones in question, than from all the other causes combined. Caries of bone is similar to ulceration of the soft parts, while necrosis may be compared to mortification of gangrene. The chief difference between caries and necrosis, is, that caries progresses slowly, not unlike an ulcer upon the skin; simple caries begins upon the surface of bone and gradually goes deeper and deeper until a considerable portion of bone is destroyed, unless it is arrested either by vital force or surgical interference. On the surface of carious bone small accumulations of pus are formed, which, together with granules of bony substance, find an exit through fistulous openings. The pus emanates from the organic matter of the bone.

When necrosis takes place the preceeding inflammation overwhelms the circulation; there is swelling and intense pain, stasis of the blood, quickly followed by suppuration, the pus makes its exit through fistulous openings or about the necks of the teeth, and the mass of bone thus involved is deprived of its nourishment and consequently its vitality. The sequestrum is surrounded by an inflammatory process, which has the effect of loosening and separating it from the living tissues. In caries the bone is eaten out upon the surface and dissolved; in necrosis it is usually honey-combed throughout the entire circumscribed mass.

The objective signs of caries of the maxillary bones are, usually, not unlike those of a chronic alveolar abscess, with fistulous openings through the bone and gums. Quite

frequently, however, the pus discharges through the cheek if the disease be in the superior maxilla, and beneath the chin if in the inferior.

The same degree of irritation exerted in different patients may be followed by different results. In case an irritation of the periosteum be established in a strong, vigorous patient, free from specific taints, it may result in caries of the underlying bone; but necrosis with the exfoliation of a sequestrum is not at all likely to occur. On the other hand, the same degree of irritation, exerted in cases of anæmic, scrofulous, syphilitic, or debilitated patients, might terminate in necrosis and the loss of a large portion or even the whole of the bone affected. The superior maxilla is more often diseased than the inferior. Of the twenty-three cases treated by me during the past year, nineteen were of the superior maxilla, while four were of the inferior.

## DIAGNOSIS.

The diagnosis of caries is usually not attended with difficulty. Through the fistulous openings a probe should be introduced, and carried to the surface of the bone. If caries exists, there will be felt, not only the denuded bone, but a roughened, pitted surface will also be detected, when the instrument is brought in contact with the bone. Caries and necrosis of bone with fistulous openings through the gums adjacent to the bicuspid or molar teeth might be mistaken for abscess of the antrum, if we base our diagnosis upon an ocular examination. In antral abscess, as in caries and necrosis, there is swelling and pain, followed by the discharge of pus into the mouth. By the use of the probe a correct diagnosis can usually be made with ease.

Caries may be complicated with, and in some instances due to antral lesions, but, happily, such instances are of comparatively rare occurrence.

## TREATMENT.

Maxillary caries may be successfully treated by either of the following methods:

1st. All loose roots, or those that can not be made useful by having artificial crowns placed upon them, should be extracted, and all teeth from which caries originates, together with roots that can be crowned, should be treated and filled. If, upon examination, we find that the bone is not diseased to a great extent, if caries has not reached farther than the bone immediately surrounding the apices of the roots of one or two teeth, and has not penetrated deeply into the bone, injections, three or four times a week, of aromatic sulphuric acid, will dissolve the decayed bone and effect a cure. A hypodermic syringe with a long flexible silver point, with blunt end, is an excellent instrument with which to carry the solution through the fistulous opening, and bring it in contact with the affected bone. Before applying the acid the cavity should be thoroughly cleansed and syringed out with a two per cent. solution of carbolic acid, and all pus, loose bone, granules, etc., removed, so that the acid will come in direct contact with the diseased bone and dissolve it. If the affection be in the superior maxilla, the patient should be placed in the recumbent position, the tissues surrounding the fistula should be protected by covering them with napkins of pieces of spunk, and the acid carried into the carious cavity and retained there twenty-five or thirty minutes so as to permit it to act upon the bone. Aromatic sulphuric acid is the dilute sulphuric acid of commerce, a 13½ per cent. solution of $H_2SO$, together with the aromatic parts of cinnamon and ginger. If aromatic sulphuric acid be used undiluted, swelling of the parts is very likely to follow. The first applications, therefore, should be about one part acid to three of water, and gradually increased to full strength, if the case requires it. The causes and diagnostic signs of necrosis of the maxillary bones have been given, in connection with the description of caries. The methods of treatment alone remain to be described.

Patients suffering from periosteal inflammation, which threatens necrosis of the bone, suffer most excruciating

pain, and it is at this stage of disease that prompt and vigorous treatment should be employed. Useless roots should be extracted, numerous free and deep incisions should be made over the surface of the bone, saline cathartics should be administered, the patient kept quiet and lying in a half recumbent position, so that gravity will aid in terminating the inflammation, by resolution. If such treatment be resorted to early, the disease may be arrested before the vitality of the osseous tissues is impaired. If, however, we find that necrosis is inevitable, that the sequestrum is forming, the treatment should consist in frequently syringing the parts with carbonized rose water, and attending to the general health of the patient. When the dead bone has separated from the living, incisions should be made so as to enable the operator to seize the sequestrum with forceps and remove it without lacerating the soft parts. After the operation, the cavity should be cleansed, and filled with the crystals of boracic acid. These crystals should be placed in the cavity daily, and in addition to this, if the cavity be large, it should be plugged with cotton, or what is far better, wax. Thus plugging the cavity, and reducing the size of the plug from time to time, so that granulations may form, will prevent a depression of the face, which is certain to result if this precaution is neglected..

Case 1. Mr. A——, aged 45. Very much emaciated, consequent upon the absorption of pus. I was called in consultation with a physician, and upon making an examination, found an opening through the external plate of the superior maxiliary bone just above the first left bicuspid, through which there was a profuse discharge of pus. The first of these openings had been made by a physician for the introduction of a drainage tube. The pulps of both bicuspids had been removed and the canals filled with gold. The fillings in the teeth and roots were removed, and it was ascertained that the upper portion of the canals had been imperfectly filled. From this space gases evidently had made their exit through the apicial foramen, resulting

in the formation of alveolar abscesses. A probe introduced into the fistula came in contact with denuded and roughened bone over a space corresponding in size to a 25 cent silver piece. Patient had been suffering from the affection about seven months prior to my seeing him, during which time he had visited a number of physicians, all of whom believed the teeth to be the cause of the trouble; also several dentists, who thought just the opposite, viz.: that the teeth had nothing whatever to do with the condition of affairs. Diagnosis was caries of the bone, originating from alveolar abscesses of the bicuspid teeth. Drainage tubes were inserted to carry off the flow of pus, and treatment was commenced by washing the parts with tepid carbolized water. Next a solution of aromatic sulphuric acid was injected through the fistula and permitted to remain for fifteen or twenty minutes in contact with the bone. In connection constitutional treatment for improving the general health of the patient was employed. Treatment was continued twice each week for a period of four months, at the end of which time suppuration had ceased and granulations filled the cavity, and by the end of the fifth month a complete cure was affected.

Case II. Mr. B——, aged 42. Had previously rendered dental services for patient, and was called in consultation with a physician. Patient had been absent from the city, had taken a severe cold, and had been suffering eight days from a pain which, commencing in the region of the superior incisiors, had rapidly extended back until the bicuspids of either side were involved. When I first saw him he was bordering on septicæmia, his face was very much swollen, eyes nearly closed and cheeks almost on a level with his nose. Pus was oozing from around the necks of all the teeth. Upon opening the mouth a cushion or sack of pus was seen, covering the whole surface of the hard palate, and totally obliterating the palate arch. The gums were pressed downward to such an extent as to cover the ends of the teeth. Upon introducing a probe, denuded bone honeycombed through and through was encountered.

Diagnosis was necrosis of the bones originating in ostitis, and involving all the teeth anterior to the molars.

Treatment consisted in evacuating pus by free incisions over the entire anterior portion of the bone, as well as of the hard palate, and washing with tepid carbolized water. The feeble condition of the patient demanded prompt and effectual treatment. Stimulants, as brandy and quinine, were freely administered. The nurse was instructed to syringe out the cavity four or five times per day with carbolized water. One week subsequent to my first visit, assisted by Prof. Gunn, I removed the affected bones, on both sides anterior to the first molar teeth. Carbolized water was used for washing the wound, tonics were continued, the wound healed quite rapidly, the soft parts contracted, and within three months after the operation an artificial substitute was inserted which almost wholly overcame the deformity.

Case III. Miss G——, age 23, very anæmic and of a scrofulous diathesis, chronic alveolar abscess of the left central and lateral incisors had existed, and were threated in the usual manner by the patient's dentist, but without success. The teeth were finally extracted, but the pus continued to flow as freely as before. The dentist then referred the patient to me, with a letter, explaining the condition in which he found her, the treatment he had employed and the result up to that time. Upon examination, caries of the bone was discovered. Treatment consisted in incisions over the surface, scraping away the softened bone and washing the parts thoroughly with carbolized water. Crystals of boracic acid were placed in the wound and covered with a pledget of cotton. This treatment was continued in connection with tonics and other constitutional remedies for about two months, when a complete cure resulted.

Case IV. A gentleman, 21 years of age, presented himself at my clinic at the dispensary, with a fistulous opening over the left superior central incisor. A probe introduced into this opening could be passed back upon the superior

2

surface of the palatal plate of the left maxilla, about two and one-half inches. The bone along the track of the probe was very much roughened and suppuration was constant and profuse. Diagnosis was caries of the bone. The tooth contained a large amalgam filling upon its disto-apppproximal surface. This filling was removed, the root cleansed and filled. The patient was etherized, and an operation consisting of cutting down upon the bone, excising the end of the root, which protruded into the carious cavity, and scraping away the softened bone, was performed. The disease had destroyed nearly all the palatal plate of the bone, together with the alveolar processes surrounding the affected tooth, and posterior to the lateral of the same side, and central of the opposite side. The patient was provided with a syringe, instructed in its use, and discharged. He left the city, and the subsequent history of the case is not known.

Case V. Caries of the inferior maxillary bone emanating from an alveolar abscess of the first left inferior molar.

An amalgam filling in the tooth was removed, and the pulp chamber was found filled with disorganized sero-pus. The chamber and roots were cleansed and filled, and an effort made to effect a cure without an operation, but at the end of two months, there being no marked improvement, I decided to operate. An incision was made through the gums, and engine bur passed in, and the diseased bone cut away. The cavity, which was of considerable size, was cleansed and filled with boracic acid crystals. This treatment was continued from day to day for a period of two weeks, when it was discontinued, and in one month subsequent to operating the patient was well.

Case VI. Mr. W——, aged 47, presented himself at my clinic at Central Free Dispensary, suffering from a severe pain in the side of the inferior maxilla. Pus had burrowed through to the integument, and by backing up, had made its exit opposite the orifice of the duct of steno. The sinus extended below the inferior border of the bone, so

low, indeed, that drainage into the mouth was impossible. An external incision was therefore made at the lowest part of the sac. Solutions of carbolic acid were injected into the pus cavity, and the bone, which was diseased by the presence of several fangs of teeth, was, after the removal of these fangs, treated by scraping and removing all carious portions. The usual subsequent treatment was employed, and in three months after the patient first presented himself, further treatment being unnecessary, he was discharged.

Case VII. Mr. K——, aged, 38. Very much emaciated from over work, was directed to me by a neighboring practitioner of dentistry for diagnosis and treatment. Upon examination I found that necrosis of the inferior maxilla, involving the incisor and cuspid teeth, and caused, no doubt, by the large accumulations of salivary calculus upon the teeth, far beneath the margins of the gums, had established itself. Assisted by Prof. Parkes I removed the alveolar processes and superior half of the body of the bone, including the teeth mentioned. The patient made a very rapid recovery. Boracic acid, daily applied to the cavity, and tonics internally, constituted after treatment. The contour of the face was restored by adjusting a plate to fit the space formed by the removal of the bone.

Case VIII. Mr. S——, aged 26. Had, previous to my seeing him, been under treatment by a dentist, with a view to adjusting a gold crown with porcelain face to the root of a left superior central incisor. An abscess had formed, which resisted the usual treatment, and swelling had extended very rapidly, involving the periosteum and overlying parts of the external surface, right superior maxilla. The root was found loosened and the bone surrounding and above it. Pus has burrowed back and elevated the periosteum from the bone as far as the third molar. The patient was etherized, and the necrosed bone, with the root, was removed. Free incisions in several places were made down to the bone, and the patient placed in the hands of

another practitioner for further treatment, owing to my being compelled to leave the city.

Case IX. Master L——, aged 13, six years ago had all four permanent molars, which were badly decayed on their masticating surfaces, filled with gold. The mallet was used freely in condensing the fillings; the patient complained of having suffered intense pain during the operations and for several weeks thereafter, especially in the region of the right superior molar. A fistula formed anterior to the tooth, near the margin of the gums, through which pus had discharged up to the present time, the patient being now under treatment. The carious bone has been removed, the acid treatment is being employed, and improvement is noticable. The exciting cause of the disease in this case was, no doubt, heavy malleting.

*Resume.* To avoid the diseases described, first, always remove loose, valueless roots that cannot be made useful by crowning. Second, always avoid the use of cotton or other material in the filling of roots which will absorb moisture, or admit fluids within the canals, since from these fluids emanate the gases which cause the inflammations that most frequently lead to diseases of the bones hitherto described. Third, never remove a tooth or root, even though the apex is standing up in the carious bony cavity, provided the periosteum intervening the carious cavity and the alveolar border be not dead. This exposed point of the root may be excised, the pulp canal filled, the carious bone removed, and the teeth restored to usefulness.

When chronic alveolar abscesses do not yield readily to the iodine or carbolic acid treatment, caries although perhaps slight, very likely exists, and the sulphuric acid treatment should be resorted to. When patients suffering from acute periostitis of the maxillary bones present themselves to us, we should unhesitatingly, and without delay, make deep and numerous incisions down upon the bone and relieve the engorged blood vessels.—*Transactions of the Illinois State Dental Society.*

## ARTICLE III.

### *The Etiology of Dental Decay.*

BY GEORGE WATT, M. D., D. D. S.,

[Read before the Ohio State Dental Society.]

For many centuries the profession rested in absolute quiet and content, holding that the well-known decay of the teeth resulted from inflammatory disease, regarding the term inflammatory in its ordinary acceptation without reaching out for such definitions as "retrograde metamorphosis of tissue,"—definitions intended to be broad enough to enwrap and hide from view the ignorance of the definer.

As long as the above views were universally held in reference to the etiology and pathology of dental decay, as indicated by the universal adoption of the term dental caries, no progress was made, or could be made, toward rational and proper treatment of this condition. I have elsewhere said, that the discovery and recognition of the fact that dental caries is something else than an ulcer, laid the foundation of dental surgery. This position was criticised with attempted severity by one who is diligently working to rool back the car of dental progress, and who, by virtue of an accidental position, apparently reached as an advertising dodge, may be able to accomplish something in his favorite direction, if still permitted to spend his strength where true progress has not yet reached its average momentum.

For more than 30 years, as some of you can testify, I have endeavored to impress on my professional brethern that this is altogether the most important question in dental science; and daily I am pained to see how little progress has been made in the third of a century referred to. So little clear thought is yet manifested, that even to-day, not only with the less educated part of our profession, but often with advanced thinkers, it is not thought necessary, or even important, to recognize varieties in dental decay.

Though the three principal varieties are not more alike than a horse, a cow and a sheep,—not more alike than boils, tetter and chilblains—they are spoken of as identical. Phenomena are referred to as found in a carious tooth without the slightest hint as to which variety of caries is spoken of. And this is as true of men claiming to be eminent in our profession as it is of the tyros.

It is well known that the physical phenomena of dental caries are not greatly varied. But three, or if we include what is sometimes called "chemical abrasion," four distinct varieties are found, and the various modifications and combinations of these will explain all the recognized different appearances.

Many of the phenomena of caries can be observed as well, or better, by the unaided eye as by magnifiers. The black, brown, yellow, orange and white colors illustrate this. And the difference in texture of the different varieties is as observable without glasses as with them. No one can fail to see, in the most common form of decay, a state similar to what is sometimes called gelatinous bone, where, to show the organic structure, the solid portions of the bone are dissolved out by hydrochloric acid. The unaided eye can see that, to a good degree, the solid materials are gone from the softer textures; and it can recognize a decided difference in the textures of black and white decays,—can see a complete breaking down in the latter, with but little displacement of materials in the other. Yet at the present time quite a number of writers for the periodicals ignore all these differences, even though they talk much of the microscope, learnedly of leptothrix, and abound in bacteria and other bugs and bushes; and with dogmatic assertion, try to carry us back to the principles held before the dawn of dental surgery—principles which had to be discarded in order that dentistry migh spring into existence and take rank as a profession.

Let it not be supposed that I undervalue microscopic research. Far from it. I gave the last dollar I had, to purchase a better

microscope than any I know of in the West, and borrowed money to pay my way home, even though I did not expect to have either time or opportunity to use the instrument in prolonged research. But let me remark that far too much confidence is placed in the statements of those who observe with high powers. This is evident from the almost constant contradictions of observers. There is great danger of optical delusions when observing with very high powers; and the danger increases in proportion to the squares of the powers. Hence the higher the power necessary to make any observation, the more caution is called for in receiving the testimony thus elicited. I am more than delighted to see these researches, but it is desirable to get the good without the evil from them. It is not strange that they receive too much credence. Human faith naturally takes hold on mystery. It is analogous to the weight given to chemical analysis in the popular mind, and which often results in the hanging of innocent men.

The germ theory of decay is lately pressed with considerable zeal. In all articles I have read in this direction, the writers show a very decided lack of clear thought as to what is held by the advocates of the so-called chemical theory. Some of them display absolute ignorance in this direction. But this is not strange, for even some holding to the "acid theory" have almost equally clouded views.

Now and then, through all the years of my connection with the dental profession, some wiseacre gets up to tell us that some constitutions are so defective that the dental organs are not well developed, and therefore decay easily. And even when they are all that ought to be expected from nature, by disease, constitutional or local, the buccal fluids become vitiated and cause the teeth to decay; and then he tells us that therefore the chemical theory does not explain all, and he announces his discovery of the "chemicovital theory," and feels that he has lifted the whole profession out of the slough of ignorance.

Of course you all know that the most enthusiastic advocate of the chemical, or acid theory recognizes all these constitutional or local predispositions, but he holds at the same time, that no tooth is so badly developed that it goes into decay without an exciting agent.

To illustrate what has been termed a lack of clear thought in reference to the chemical theory of decay, it may be necessary to make a few somewhat lengthy quotations. It is hoped the reader or listener will be patient in proportion to the importance of the subject.

In a paper read by Prof. C. W. Spalding, at the annual meeting of the Illinois State Dental Society for 1881, he says: "In common, I believe, with many other practitioners, I have supposed that an acid condition of saliva prevails, or at least may usually be looked for in most cases of rapid decay of the teeth."

Now, while all the above is true, it shows great lack of clear thinking in reference to the acid theory of decay, which the Professor seems to countenance mainly in this article. Acids diffused throughout the buccal fluids, and therefore quiescent, can not cause dental caries. If the proper acid, and sufficiently concentrated, it may corrode the teeth, especially if dentine or cementum is exposed. But the acid which excites caries, as Dr. W. A. Pease lately expressed it, is generated, "*de novo*, on the spot."

Professor S. goes on to say: "My first experiments were made upon the saliva of a young girl (aged 12), whose teeth were decaying rapidly, so much so that fillings previously inserted, that is before the case came into my hands, whether of gold or other materials, had lasted but a short time, and in whose teeth new cavities were constantly forming, and this at so rapid a rate that cavities of considerable size would form in the space of a few months, notwithstanding pretty thorough cleanliness and good general care. I looked to find an acid reaction of the saliva in this case, and had been reflecting on a course of medical treatment, having in view the correction of the supposed condition of the saliva. What, then, was my surprise, on finding, after repeated tests, that the saliva of this young person exhibited in every test either a neutral or a slightly alkaline chemical reaction! In no one of a large number of tests was there any, even the smallest acid reaction shown. I immediately sought other cases where a similar destructive process was going on, but the result in each case was precisely the same as in the case just narrated. * * *

A professional friend also made similar tests in some very

marked cases of rapid decay, with the same results—no acid condition of saliva revealed."

It is unfortunate that Prof. S. and his friend have failed to tell us what variety of decay prevailed in these cases. By making this omission they have almost failed to tell us anything about them; but it is quite probable the decay was light colored. It is well known that black decay is the least destructive and the slowest in progress of the several varieties of caries, while the light colored is the most rapid and disastrous. It is well recognized, too, by the thoughtful, that an alkaline state of the buccal fluids is a usual precursor of white decay. Many of you will bear me witness, that in the college, and in this society and others, I have diligently warned you of the danger of an alkaline reaction of the saliva, and have persistently urged an acid course of constitutional treatment whenever white decay is prevalent, or tartar is abundantly deposited. I have talked about pickles, vinegar, lemonade, saur-kraut, etc., till your ears have tingled with the names. And why? All well-posted advocates of the "chemical theory of decay believe that the exciting agent—the immediate thing that does the business, without anything between it and the mischief—acts in its nascent state ' results from two distinct processes, the effect, that is, the nascent agent's activity, being the same. It may be produced either by synthesis or analysis, as for example, if sulphur is oxidized in the presence of water, sulphuric acid results, and thus resulting, it is nascent. Or a sulphate may be decomposed, the base combining with some other acid, and thus setting the sulphuric acid free, and in this condition it is nascent. You all know that in their nascent state chemical re-agents manifest greatly increased powers.

[TO BE CONTINUED.]

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## ARTICLE IV.

### *A Class of Pulpless Teeth, their Treatment.*

BY A. M. ROSS, CHICOPEE, MASS.

I have prepared this paper without reference to the literature of the subject of treating pulpless teeth, it being

rather a result of long experience with a certain substance with the rationale of its application to a certain class of teeth. I know that the substance is used, to some extent, by dentists to accomplish the result for which I use it, but I do not recollect of ever reading any *scientific* reason *why* it is used. About eight years ago, while in practice with my father in Troy, N. Y., I had my attention called to the permanganate of potassa by a friend, a druggist in the city. We made many experiments with it—not confining our attention to spittoons—to prove its antiseptic property, and we were surprised at the time by the fact that but a small amount of the crystal was necessary to decompose a comparatively large amount of putrefactive matter.

Since that time I have used it extensively in my practice in treating a certain class of pulpless teeth.

I will not say that the subject of treating this class of teeth is an uninteresting one to dentists, but my methods and reasons for them may be quite uninteresting, and I will use as few words as possible in so doing.

I believe that the use of the permanganate of potassa in all teeth where decomposition of the pulp has occurred, is attended with greater certainty of result favorable to the pericementum and subjacent tissues than by the use of salicylic acid, carbolic acid, and other preparations from phenol. Of the derivations of phenol it may be safely asserted that they *prevent* decomposition of normal albuminous matter by coagulation, deeply or superficially—but that they do not, or cannot decompose products of albumen, their action being a coagulating one rather than a decomposing one, I refer to the contents of the walls of the pulp cavity and do not wish to be understood as applying my remarks to pericementum for this reason: Upon the death of the pulp the albuminous matter in the dentinal canaliculi coagulates at first, and thus the structure is rendered opaque. This is the first change that occurs, which is followed by the decomposition of the coagulum. Now if the pulp is removed before death, and the cavity

immediately saturated with carbolic acid, a coagulum is formed that is not so easily decomposed; or if the treatment is adopted after the removal of an arsenized pulp, the result may be as good, because arsenic does not coagulate albumen, if our esteemed friend, Prof. Mayr, is correct. (I would say in parenthesis that in view of the circulation that is maintained in the cementum and the periphery of dentine of "dead" teeth, and the fact of long continued action of arsenic, unless the arsenized fluids can be coagulated, I think that something else than arsenic for destroying pulps should be used.)

Death of the pulp is followed by decomposition. Decomposition, of the pulp from any physiological or pathological cause will produce the sulphides of albumen, sulphuretted hydrogen, etc.

After the pulp-chamber of the tooth has been freely opened, so that the canal or canals may be entered by a smooth broach, less than a grain of the potassa is placed in a half ounce of cold water, or about in that proportion, about a drachm being prepared for a treatment. A little absorbent cotton is roped on the broach, saturated in the solution and introduced but a short distance, and immediately removed. The color is changed. The fluid as introduced is a beautiful purple; upon removal it is brown. In this way a number of twists of cotton are wet in the solution, each in turn forced further into the canal, until the bits of cotton upon removal are found to be but little changed in color from purple. Thus I have used as many as twenty little twists of cotton in a *first* treatment. By taking precaution to never make the solution too strong, I have obtained most satisfactory permanent results. I have frequently conversed with Prof. Mayr upon this subject and have been enlightened upon it very much. I will briefly state that the permanganate of potassa is maganese peroxide, plus oxygen, plus potassium; that there is an excess of oxygen ready for combination; that this oxygen being brought into a cavity containing sulphides of albu-

men or sulphuretted hydrogen, these are decomposed and water is formed, etc., and the permanganic acid is thus reduced to the peroxide of manganese, or oxide of manganese, according to circumstances, both of which are brown in color. The use of this chemical in treating a certain class of pulpless teeth insures the decomposition of those products that are the feeders of pyogenic membrane, and the sense of *sight* being quite sufficient to make apparent the accomplishment of this. We hear much talk about the ease and certainty with which certain bicuspid and molar buccal roots are opened, cleansed and filled with gold, etc. A careful study of *many* such roots by transverse sections under the microscope would show how utterly impossible this is in a great majority of cases, and how impossible it is to conjecture about the size and character of canal by outside formation, and we don't even have this to guide us except in cases of replantation.

I speak of this to show how impracticable much of this talk is about *mechanical* dexterity in treating and filling pulp canals. It is misleading to those who do not know much of tooth anatomy. In many cases it is not possible to reach the apices of roots, and the closing up of that portion of the root *has to be done as near* the apex as possible. Now if the canals in many bicuspids are plural, elliptical in transverse shape, in buccal roots of superior molars the same, how are we to be certain of a good result in any case except where we use an agent that shall form new compounds and leave a veritable and comparatively insoluble new product in place of the old decomposing one? An agent that can be flooded over all surfaces? This agent *does* stain dentine, but so slightly if the proportions of crystal to water are right for each case that the surface of the tooth does not reveal it. But is not the oxide or peroxide of manganese preferable as a deposit in the open ends of the dentinal canaliculi than some of the products of decomposed albumen? The proper *treatment* of this class of pulpless teeth is of as much importance as the after *sealing of*

*ends of the canal;* both operations being thorough, the material with which the *root is filled* is of very little importance.—*New Eng. Journal of Dentistry.*

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## ARTICLE V.

### *Remarks on Compressed Nitrous Oxide Gas.*

BY ALFRED COLEMAN, L. R. C. P., F. R. C. S., L. D. S , &C.

Nitrous oxide was first liquefied by Faraday, who employed the following method: Some nitrate of ammonia was placed at one end of a strong glass tube, bent near its centre at an angle, and then the other end was hermetically sealed. The end containing the salt was exposed to heat, and the gas thus generated exerted so prodigious a pressure that it became liquefied in the other extremity, which was kept cool. The pressure was ascertained to be 50 atmospheres equal to 750 lbs. on the square inch at 45° Fahr. The experiment was a very dangerous one, and the experimenter ran considerable risk, even though his face was protected with a wire mask and his hands with thick gloves.

Faraday afterwards accomplished the same object by direct pressure. He employed two condensing syringes fixed to a table, the first having a piston of an inch in diameter, and the second a piston of only half an inch in diameter, and these were so associated by a connecting pipe that the first pump forced the gas into and through the valves of the second, and then the second could be employed to throw forward this gas, already condensed, to ten or twenty atmospheres into its final recipient, the condensing tube, at a much higher pressure.* This is much the same process as is now adopted for liquefying the gas, and the apparatus as employed by Messrs. Coxeter was exhibited at the interesting lecture delivered by Mr. Braine before the Odontolog.

* 'Elements of Chemistry.' By Thomas Graham, F. R. S. Vol. i, p. 71.

ical Society, May 6th, 1872. According to a well-known law gases expend in a certain proportion for each increment of heat, but what this is for nitrous oxide has not been very accurately determined. Accordingly to Roscoe and Schorlemmer,† the pressure necessary for the liquefaction of nitrous oxide is 30 atmospheres (450 lbs.) on the square inch at 0° Cent.; consequently, as the pressure required for the same at 45° Fahr. is, according to Faraday, 50 atmospheres, this would give 20 atmospheres for 13° Fahr., or over 1½ atmospheres to each degree Fahr. Messrs. Barth & Co. inform me that they calculate an increase of 100 lbs. pressure for each 10° Fahr., or 10 lbs. (⅔ atmosphere) for each degree Fahr., or rather more than 1 atmosphere for each degree Cent., and this again corresponds more closely with Faraday's table for carbonic acid; thus at 0° Fahr. the tension of that gas is 22·84 atmospheres, and at 32° Fahr. it is 38·50 atmospheres, or about 12 atmospheres for 18° Cent.; nitrous oxide being less compressible would show a higher rate, and it is, I think, probable that Roscoe and Schorlemmer mean 30 atmospheres at 0° Fahr. about—18° Cent., and not at 0° Cent. The matter is one of interest, and could be readily worked out by those who liquefy nitrous oxide on a large scale.

The bottles constructed for containing the liquid nitrous oxide, at least those supplied by the Messrs. Barth and Messrs. Coxeter,* are, I am informed, tested by the maker up to a pressure of 4400 lbs. to a square inch; they could probably resist a much greater strain, but for all practical

† 'Treatise on Chemistry,' vol. i, p. 417.

* I have recently seen some bottles not supplied by the above firms, which, in addition to having flat bottoms instead of dome-shaped ones—an element of weakness—have apparently no neck welded into the upper end of the bottle into which the valves are screwed, as in the bottles supplied by the above-named firms, but the valves have the appearance of being soldered into a hole made in the flat top of the bottle; or if screwed at all it must be into only a comparatively thin surface of metal and the valves would be liable to break off from a heavy blow or fall, and, perhaps, with very disastrous consequences.

purposes we must reckon their resistance at that. At a temperature of about 50° Fahr. Messrs. Barth and Co. found that directly some of the gas became liquefied a pressure-guage indicated 900 lbs. on the square inch, but this pressure was not increased when the vessel was completely filled, and which would be conformable with known laws.

In calculating the increased pressure for increased temperature we may, I think, fairly take the simple calculation of Messrs. Barth & Co., viz. 10 lbs. for each degree Fahr., and starting with Faraday's statement that liquid gas exerts a pressure of 50″ atmosphere equal to 750 lbs. at 45° Fahr. we should if the gas were raised to 212° Fahr., the boiling point of water, have a pressure on the bottles of 2420 lbs. to the square inch, thus leaving in the bottle still one-half of its capacity of resisting power. This calculation, if it be correct, is very assuring, as it shows that gas bottles must be perfectly safe for all other than extraordinary temperatures.

In the case of the bottles employed for the compressed—not liquefied—gas the conditions are very different. The bottle which caused the melancholy accident detailed in the last number was a large iron bottle calculated to hold forty-five gallons of gas compressed at 25 atmospheres equal to 375 lbs. on the square inch. Now the contents of such a bottle, which is tested to only 1000 lbs. to the square inch, would if heated up to the boiling point of water, exert a pressure of probably over 1000 lbs. on the square inch, and if so, would undoubtedly burst. Had the bottle been one for liquid gas it is more than probable that it would have attained the melting point of the solder without bursting. There can be no doubt, but that the bottles for compressed gas should be at once and forever discarded; they might even burst if left in the rays of a tropical sun.

Still assuring though the calculations may be regarding the safety of the bottles for liquid gas, there are nevertheless still questions of some moment to those who habitually

employ them. The first may be, does the liquid gas in any manner act upon the iron of the bottles? We should apprehend it would not, and I am informed that it has no corrosive action upon them whatever. In the second place, it may be asked are the bottles re-tested on each occasion of their being re-filled, and can we rely on their retaining the original pressure test? When liquid nitrous oxide was first introduced, I insisted on our having some guarantee of the resisting power of each bottle when sent out full of gas. I urged the matter strongly on the attention of the Odontological Society, and was, I recollect, considered fussy—disagreeably so—in the matter. To the Messrs. Coxeter I suggested that each bottle before being sent out should when filled be immersed for some time in boiling water; they expressed their willingness to adopt this test, if desired, but pointed out the undesirableness of continually exposing the bottles to a severe strain as likely to weaken them. I think, however we might ask that each bottle before being refilled should be tested by hydraulic pressure, a process far less likely to injure them than an elastic pressure, and very easily carried out to say 3000 on the square inch.

But the most important question to my mind is what would be the condition of an operating room, for instance, containing gas bottles if it took fire; who would dare enter such a room to extinguish the flames, and if they did what frightful risk would they not run? That gas bottles have survived such a catastrophe is no argument that they should always do so. To obviate this danger I have suggested, and the idea has occurred to others, that each bottle should have a small hole drilled from its exterior near the bottom diagonally upwards into its interior, and that this should be filled up with a metal melting at or below 400° Fahr. from its direction the pressure would be exerted on it to only the smallest degree, whilst in the case of fire the bottle would discharge itself with, at all events, the minimum of dangerous effects, a little hot spelter being scattered about.—*British Journal of Dental Science.*

## ARTICLE VI.

### *On Dental Fistula.*

BY CHEVALIER CACCIACUERRA, M. D., OF CATANIA, ITALY.

[Translated from the Italian by C. W. Dunn, L. D. S. Eng., of Florence.]

Through the effect of caries, either in the second or third stage, in subjects affected by constitutional tendency, under the influence of occasional causes, inflammation of the dental pulp and periosteum often occurs, causing a swelling, accompanied by inflammation, extending to all the maxillary region, which may terminate either in absorption or suppuration; the anti-inflammatory treatment facilitiates these two results. In absorption all is finished, whereas in suppuration, when every other inflammatory symptom has ceased, there often remains an alveolar abscess and fistula, produced sometimes by the purulent secretion of caries, sometimes by the introduction of air, which passing through the dental canals comes into contact with the periosteum and alveolar membrane. These becoming inflamed communicative the inflammation to the external tissue of the gums on the edge of the alveolar process, which is the point it generally selects; there may also be developed an irritation solely of the soft parts of the dental canals, with or without a slight inflammation on the edge of the external maxillary bone.

The abscess has almost the form of half a pea, and contains a secretion either watery, or of matter, or air or blood, according to the predominant tendency in the system of the patient. The spontaneous or artificial discharge of the contents cause pain to cease, and diminishes the partial inflammation (if such exists), both secondary symptoms depending on the caries, which with the gradual inflammatory process it generates, destroys the pulp and with it the abscess.

In order to cure this disease, and not wishing to extract the tooth, I made a transverse puncture, which, facilating

the discharge of the contents of the abscess, brought about diminution of volume during recovery, and little by little the cure; this happening after some time had passed, I was in doubt as to whether it was the effect of the treatment or simply the effect of the disease itself which had destroyed the dental pulp; nevertheless I used this method, as by it, I obtained restriction of the disease until a complete curve was affected.

More than a year after the replanting of the first bicuspid on the left side of the upper jaw, contrary to the usual course, the dental fistula was not cured by the grafting, but only diminished in volume and in extent. Hoping for a cure with time, I allowed some months to pass, but the abscess was persistent, being kept up by the second bicuspid, which was also decayed, and which had been filled before the grafting of the first. Instead of making a second replantation I wished to try the effect of chromic acid.

With a straight pair of scissors I removed the projecting gum round the fistula, and there remained then exposed a wound of circular form, to which I applied chromic acid on lint, leaving it for twenty-four hours; the next day I removed the dressing, and with it the crust. I then renewed the cauterization, leaving the lint for an hour only on the wound. Similar treatment was repeated for three days, and I obtained the destruction of the base of the tissue which formed the abscess. I then left the last crust to fall off by itself, and in nine days the cure was complete.

Having succeeded in this first case, I wished to try it in others, where the tooth had not just before undergone the operation of grafting, and so to prove whether in all dental abscesses I could attain the same success, and I had seven other successful cases, in the course of which I found that if the inflammation around the wound had not entirely ceased, and although no secretion might be formed, the application of chromic acid ought to be renewed every day or two.

The result of this method is the total destruction of the dental abscess, leaving uncovered that portion of the root

which sustained it. In some cases different degrees of sensitiveness when in contact with external agents remain, in others insensibility.

The circular border which surrounds the denuded part presents a healty color, which in progress of time gradually closes without producing any irritation, and for two reasons: the first, because after the total destruction of the tissues and of the periosteum of the root, a species of atrophy takes place in the denuded part, forming a layer of very fine dentine; secondly, because in the parts where the abscess was formed there are no longer any soft parts to become inflamed.—*British Journal of Dental Science.*

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## ARTICLE VII.

### *Sarcoma of Left Superior Maxilla and Cheek—Removal and Recurrence.*

BY GEORGE LAWSON, F. R. C. S., SURGEON TO MIDDLESEX HOSPITAL, ETC.

On June 12th, 1882, E. A.—æt. 18, a domestic servant, was admitted into Regent Ward for growth of upper jaw, with following history:

Christmas last she suffered with severe pain in region of molar teeth of upper jaw (left), extending over side of face; was told by medical attendant that it was due to cutting of wisdom teeth.

In the following January a swelling was first noticed in left cheek which rapidly increased, she therefore was admitted into St. Bartholomew's Hospital, Rochester, when an incision was made into left cheek and tumor was removed. The growth at that time was larger than at present.

Erysipelas followed the operation, but she made a good recovery.

Six weeks ago she first noticed swelling again in left

cheek at site of operation, which increasing she applied for admission, and presented following conditions:

A fairly well-nourished young woman, complaining of pain and swelling of left cheek, which is much enlarged, and presents a cicatrix the result of previous operation. A hard lump is felt superficially about the size of a walnut, which is connected with a similar mass attached to left superior maxilla. The mouth can only be opened to a small extent; teeth are perfect in both jaws. The roof of hard palate on left side is seen to bulge into mouth, and there is some swelling about the alveolar process; left nostril is completely blocked up. The left eye is pushed upwards and outwards, the sight of which is destroyed. There were no enlarged glands.

On June 14th, Mr. Lawson completely excised the left supra maxilla in the usual way, and also removed that portion of the growth which had invaded the cheek; actual cautery was then applied to the deep parts of the wound and to the cheek. Chloroform was administered but not to complete anæsthesia.

On examining growth it was found to be rather soft in consistence, of a pale, yellowish-white colour and encapsuled, and presented a lobulated cauliflower appearance.

Microscopically it was seen to be composed chiefly of small round cells, but in places there was a considerable growth of spindle-cells and fibrous tissue.

Patient rapidly recovered, on July 1st wound was healing well, on the 6th was quite healed externally.

On July 11th she complained of great pain in front of left external auditory meatus, where a swelling was found. The sight of left eye was completely destroyed.

On July 25th she was discharged, there appeared to be a recurrence of the growth in the cheek and also in the hollow left by the removal of the supra maxilla.—*British Journal of Dental Science.*

## ARTICLE VIII.

### *Fracture of an Upper Molar Caused by a Fall.*

BY C. VINCENT COTTERELL., L. D. S., DENTAL SURGEON TO ST. BARTHOLOMEW'S HOSPITAL, ROCHESTER.

Writes Colonel H. W,—of the Royal Engineers, whilst stationed at Chatham in 1852, thirty years ago, was attacked with acute periostitis in the upper wisdom tooth of the left side through cold, and attributing the pain to caries, consulted his friend, a medical man, who immediately extracted the tooth. As there was a total absence of caries, the inflammation was assigned to the rheumatic diathesis.

Ten years afterwards in attempting to mount a restive horse he vaulted over its back and fell heavily on the grass, striking his right shoulder and cheek. On regaining his feet he imagined he had dislocated his shoulder and broken his jaw, which happily the army surgeon assured him was not the case. Great difficulty was experienced for many days in opening the mouth owing to stiffness of the muscles, but beyond that no dental disturbance took place. About eight years elapsed, when a piece of bone worked out of the place where the wisdom tooth was extracted, which the army surgeon said was a piece of alveolus.

In 1881 he consulted me for advice respecting an offensive taste proceeding from the region of the second upper molar of the left side, and also produced the so-called piece of alveolus which I found was the root of a tooth. After a careful examination with my probe I passed it into a cavity, situated on the distal surface and about the eighth of an inch above the neck of the tooth. As the tooth was loose, and the discharge caused the patient considerable annoyance, I extracted it, when I found the posterior buccal fang was missing, and when the root, which had worked out eight years previously, was put to the broken surface it

articulated most perfectly, showing clearly that it belonged to the tooth just extracted. The discharge immediately ceased, which has led me to the conclusion that the tooth was broken by the fall, and the pulp had retained its vitality for some years, its decomposition taking place just prior to the appearance of the discharge—*British Journal of Dental Science.*

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## ARTICLE IX.

### *What the Cell Can Do.*

Water, earth salts, and the gases—the raw materials which the plants suck up—are changed within the cells into starch and sugar, gum and woody fibre, albumen and wax, oil and resin, into powerful medicines and deadly poisons. The simplest plant possesses an art which the most skillful chemist has not been able to learn from it. It is true that the chemist can artificially prepare in his laboratory many of the substances which the plant-cell likewise produces; he can convert the starch of the potato into the sugar that gives the wine-grape its sweetness; this, again, he can transform into the fruit-acids which, in connection with the sugar, give the berries their fresh and agreeable taste; he can even produce the flavor of the fruits from the fusel-oil which he obtains by the fermentation of the sugar. He can make the oil of bitter almonds from benzoic and formic acids; he can, with as good art, imitate the pungent taste of the pepper, and the biting one of the mustard-seed, and the narcotic poison which only the nightshade has hitherto prepared for the healing of sore eyes. He can produce from the sap of firs the crystal-needles of the vanilla, for which a Mexican orchid has heretofore been obliged to give up its pods; from the distillation of wood he obtains a smoky fluid, from which he procures salicylic acid, for the production of which the flowers of the meadow-sweet or the bark-tissues of the willow were formerly required; and from this

he makes also the ink coloring gallic acid, which formerly only a little wasp knew how to draw out by its sting from the cells of the oak, and the aroma of the wood-ruff. He has made the work of the cells in the madder-root superfluous, for he has fabricated its costly dyes, along with a hundred other splendid pigments, out of tar oil and stone-coal, and is now on the point of taking its works away from the indigo-plant by artificially producing indigo. But a raw material which has at some time been brought forth out of the laboratory of a living plant-cell always lies at the foundation of all these manipulations of the chemist, wonderful as they are. And, notwithstanding the immense progress that modern chemistry has made within the last ten years, its art is still limited at this point: no prospect yet exists that it will be able, artificially, to produce the most important of all the substances that go to build up the bodies of animals and plants, and, to form their living cell-tissues—protoplasms, or the envelope of the plant-cells, the matter of the muscles and nerves.—*Professor Ferdinand Cohn, in Popular Science Monthly for December.*

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## *Dental Department of the University of California.*

The Dental Department of the University of California held its *first* commencement exercises at B'nai B'rith Hall, San Francisco, on Wednesday evening, November 8th, 1882.

An address on behalf of the State was delivered by Governor Geo. C. Perkins, and also one on behalf of the Board of Regents by Rev. Horatio Stebbins, A. M., D. D.

The valedictory on behalf of the Faculty was delivered by the Dean, Prof. S. W. Dennis, M. D., D. D. S., and that on behalf of the graduating class by Henry John Plomteau.

The number of matriculates was thirty-two.

The degree of D. D. S. was conferred on the following

members of the graduating class by W. T. Reid, A. M. President of the University.

Thomas Watson Hall, Oakland, Cal.; Charles Wesley Hibbard, San Francisco, Cal.; Thomas Morffew, San Francisco, Cal.; Henry John Plomteaun, Oakland, Cal.; Charles Wesley Richards, San Fracisco, Cal.; Wm. Henry Stanley, San Francisco, Cal.; Gustav William Sickel, M. D. San Francisco, Cal.; August Van Crombrugghe, San Francisco, Cal.;

Unlike the Eastern colleges the Medical and Dental Departments of the University of California hold their sessions in summer instead of in winter.

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# EDITORIAL, ETC.

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*Liability of Dentists.*—From the New York Press we learn that in a recent case before the Marine Court of that City, a patient having brought suit against Mr. Colton, of Nitrous Oxide Gas fame, to recover damages for injuries alleged to have been caused by a portion of a tooth, which was being extracted, falling down the plaintiff's throat while under the influence of the gas, the Court (Judge McAdams) decided that while a patient was under the influence of an anasthetic which deprived him of the use of his faculties, it was the duty of the dental operator to exercise the highest professional skill and care to avoid every

possible danger; and that the circumstances of the case in question were sufficient to show negligence. The jury accordingly found a verdict against Mr. Colton and awarded the plaintiff five hundred dollars damages.

In this case it was alleged that a portion of the tooth escaped from the forceps, and passing into the throat, for four weeks occasioned a cough and irritation until it was finally expectorated.

This decision is of importance to dentists, as frequently lawsuits are resorted to by patients who imagine themselves sufferers by unavoidable accidents, and where juries award damages on account of proneness to condemn through ignorance or inability to judge correctly of the merits of such cases.

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*A Generous Contribution to the Museum of the Dental Department of the University of Maryland.*—Dr Genese who has been engaged in the practice of Dentistry for a number of years past in France and England, and who is a graduate of the Dental Department of the University of Pennsylvania, has presented to the Museum of the Dental Department of the University of Maryland a large number of valuable and interesting specimens, both pathological and mechanical. Among the former are a number of skulls, maxillæ, abnormally shaped teeth, etc. etc; and among the latter artificial teeth carved from ivory and bone and mounted upon different bases, with many unique forms of teeth in use at an early period in the history of dentistry.

The Museum of the Dental Department of the University of Maryland is rapidly increasing, hundreds of valuable specimens having been presented since its organization, until at the present time it will compare favorably, in the value of the specimens, with Museums of much older institutions. Indeed, success appears to have followed every effort to make this Dental Department a true exponent of dental teaching: and the present session affords an evidence of the appreciation of the profession for increased facilities and advantages in the acquirement of dental knowledge.

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In the December number of this JOURNAL some extracts from a paper on Dental Colleges, by Dr. A. Berry, were inadvertently

We gladly welcome another edition of this standard work; and, although the author announces that the changes in the new edition have not been so great as those in the former edition yet we find while a number of instruments and appliances have been omitted as superseded, others of recent invention have been added.

We have from time to time reviewed the different editions of this standard work which is so favorably known and appreciated as to require no further praise at our hands. The style and composition of the new edition are in no respect inferior to those of other years, and are creditable to the well known Publishers.

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*Elements of Dental Materia Medica and Therapeutics with Pharmacopœa*:—By James Stocken, L. D, S. England. Assisted by Thomas Gaddess, L. D. S. England and Edin. Publishers: P. Blackiston, Son & Co. Philadelphia. 1882.

The recent advancement of Dental Pharmacology, and the demand for such a work, has caused the Author to present a third Edition, in which the old matter has been revised, several new preparations inserted. as well as other important additions made, all of which enhance the value of this work very materially. The Index of Diseases is also an interesting and important addition, and the present volume is one-fifth larger than the former edition.

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*The Pharmacopœia of The United States of America.*—Sixth Decennial Revision. By Authority of the National Convention for Revising the Pharmacopœia, held at Washington, A. D. 1880. Publishers: William Wood & Co. New York, 1882,

The fifth edition of this Pharmacopœia appeared in 1873, hence the present edition contains much more valuable information, as it is revised after an interval of nearly ten years. The revised nomenclature on the basis of certain general principles, appears in the present edition. The well known Publishers have presented the work in an admirable style, with large and clear type, and in every respect attractive and useful.

# MONTHLY SUMMARY.

*Resolution of Alveolor Abscesses into Serous Cysts.*—Dr. Willoughby Weiss, L. D. S. England, says that E. P,—æt. 28, married, came to consult me, at the Western General Dispensary, respecting two swellings in the mouth.

The history she gave was that about three years ago she had an attack of erysipelas, and during the time suffered great pain with her teeth. She ultimately recovered from the erysipelas, but still continued to suffer with tooth-ache; she did not, however, seek advice, and at the end of two or three weeks these swellings occurred, and had remained ever since. At this time she lost all pain, and only suffered a very little since when the weather was damp, which caused the tumor to slightly increase in size. At the early part of the disorder she had noticed a very nasty taste in her mouth, but this for some months had almost entirely disappeared.

Upon examination I found one tumor about the size of a walnut situated on the left side of the superior maxilla, in the region of the first molar, the roots of this tooth being in the jaw (as indeed were the roots of all the molars,) and somewhat loose. There was slight fluctuation, although not very marked, and no *craquement*. I removed the roots, expecting pus to flow from the opening, but instead, a clear thin glairy fluid escaped into the mouth, showing that the alveolar abscess, which it had undoubtedly been, had resolved into a serous cyst. The walls almost entirely collapsed, but I assisted the flow of the fluid by a little digital pressure and then syringed the cavity out

with very dilute sulphate of zinc. The second swelling was on the left side of the inferior maxilla, in the region of the first bicuspid, the root remaining in the head, and with all the conditions presented in the upper jaw. I at once removed this root and a clear thin glairy fluid escaped, as in the other tumor. I treated this in the same way, pressing in the walls and syringed the cavity out with very dilute sulphate of zinc.

I then directed the patient to see me at the end of a week. By this time the swelling in the lower bed had entirely disappeared, but a probe could be passed a short way down where the root had been removed; in the upper, the alveolus was at the anterior part slightly distended. I crushed this with the fingers, and told the patient to come again in a week's time. Everything was now in a normal condition, the swellings having entirely disappeared, the opening for the roots having almost entirely closed up by granulations, so I discharged the patient. —*British Journal of Dental Science.*

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*A New Remedy for Spasms.*—The *Med. Central Zeit.*, of July 15, 1882, publishes the result of experiments instituted by Dr. Schiffer, of Berlin, for the purpose of determining the therapeutic value of the *extract of Guachamaca*, a tree indigenous on the Apuche mountains. As a specific for all spastic conditions of the motor apparatus we so far possessed, in reality, one remedy only; curare, which, however, on account of its danger, and the uncertainty of its action, as well as of the remedy itself, has mostly been used for physiological experiments alone, and, perhaps, occasionally in tetanus.

Guachamaca extract, prepared from the bark of the Quebracho plant, which belongs to the same class as the Oleänder (Nerium ol. L.) and of which latter the skin between tree and bark is also poisonous, is a remedy which, while not so dangerous in its effects, is far more reliable and uniform in its action, and can besides easily be procured pure and genuine, and of always equal strength, as it is by no means rare.

Schiffer experimented with this drug, and made his observations in the clinic of Prof. Frerichs. He employed the remedy in solution, in the dose of $\frac{1}{8}$ of a grain, and by the hypodermic method, in cases of tonic and clonic spasms of the muscular

system, and always with a very good effect. He noted also that, administered internally, no matter in what solution. the drug was as little absorbed by the mucous membrane of the elimentary canal as curare is.

Should further trials with this remedy prove invariably as successful, or at least frequently so, as was the case in Schiffer's experiments, we would at last possess a reliable specific for all spasmodic affections of muscles and motor nerves, a drug, the physiological actions of which would be exactly opposite to that of strychnine and similar remedies.—*Med. and Surg. Reporter.*

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*Hemorrhage after Teeth Extraction.*—Male, had eight teeth extracted nearly a week ago and is still suffering from hemorrhage.

An examination of the sockets of the teeth shows that the operation has been skillfully done. I can discover no fracture of the jaw, and no extensive ulceration of the gum. Ordinarily, bleeding from the socket of the tooth is arrested in the course of an hour. In this case it has lasted five days. The loss of blood has not been very great, and yet the patient says the bleeding has been continuous. The occurrence of persistent bleeding after the extraction of teeth does not always depend upon the same cause. Sometimes, after the extraction of teeth, as in fracture of the jaw, an artery of some size may be injured, but ordinarily the cause is found to be a tendency on the part of the patient to bleed whenever wounded. There is some evidence that this man is a "bleeder." He had hemorrhage from slight cause in England about eight years ago, lasting for a week. When he cuts himself the bleeding lasts for a considerable time. In some of these cases life is threatened, or even destroyed, where the bleeding occurs as the result of operative interference. I see the sockets of two teeth which are in a bleeding state. One of these is that of the left lateral incisor. The place where it has bled is marked by the presence of a plug of coagulum. There has also been bleeding from the sockets of the first or second molar.

*Treatment.*—I should suggest plugging of the sockets of the teeth with a piece of cotton impregnated with perchloride or persulphate of iron. If this fails to stop the bleeding, I should

recommend the application of actual cautery. A case of this sort recalls to mind the fact that persons in whom this tendency exists should not be subjected to surgical operations. I read recently of a death which took place in a bleeder in consequence of a slight cutting operation. There are instances in which, although death has not occurred, obstinate hemorrhage has taken place, lasting a long time and nearly exhausting the patient. The hemorrhage depends upon the extreme tenuity of the blood vessels, in consequence of which they are deprived partly or wholly of their contractile power, upon the presence of which, to some extent, the arrest of bleeding depends.—*Henry B. Stubs, in Western Med. Reporter.*

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*Treatment of Diptheria.*—Dr. J. J. O'Dea. of Stapleton, N.Y., recommends the following and, as he claims, successful local treatment of Diptheria: To the entire inflamed surface surrounding the false membrane, and close up to its border, he applies, by means of a cotton-wad, the following solution:

℞. Argenti nitrat, cryst............................℈ j
Spt. æther, nit. dulc...................................iv,
Aquæ destill.............................................ʒ iv. M.

In the same manner he then makes an application of the following mixture to the surface of the false membrane. and out to its extreme edge, but no farther:

℞. Acid. carbol. .......................................gr. viij.
Liq. ferri subsuph.................................ʒ ijss,
Acid. sulphurosi...................................ʒ iijss.
Glycerine............................................ʒ j.

M

These are to be repeated twice, or possibly three times, in twenty-four hours, the second mixture to be supplemented by a gargle of lime water, thus allaying irritation and removing the *debris* of false membrane broken down by the action of the acid. When nothing remains of the deposit save some milky white patches he omits the applications and employs only the lime-water gargle or spray.—*Med. Record.*

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## ARTICLE I.

### *Bromide of Ethyl, the Most Perfect Anæsthetic for Short, Painful Surgical Operations.*

BY JULIAN J. CHISOLM, M. D.,

Professor of Eye and Ear Diseases in the University of Maryland, Surgeon in Charge of the Presbyterian Eye and Ear Charity Hospital, Ophthalmic Surgeon to the University Hospital, etc.

(*Read before Balto. Academy of Medicine, Dec.* 5, 1882).

Three years since, when the Bromide of Ethyl was brought prominently forward as a substitute for chloroform by Dr. R. J. Levis and Dr. Laurence Turnbull, both of Philadelphia, I, with other surgeons, experimented with the new anæsthetic, with the intent of comparing its reputed advantages with the well-known agents sulphuric ether and chloroform. I discarded it after a very short trial on account of its apparent inefficiency, and because of the very evanescent nature of the sleep induced by it. I found great difficulty in puting my patients to sleep; and when at last narcotised, they would suddenly recover consciousness at most awkward periods in the midst of eye operations, to my serious annoyance. In two cases especially, in which I continued the inhalation from time to time as I would have

done with chloroform; until upwards of an ounce of the bromide of ethyl was used, nausea and vomiting followed, which, in its severity and duration, I have rarely seen exceeded in the most sensitive of my chloroform patients. For twenty-four hours the sickness of stomach continued, The hospital ward in which the patients were lying had its atmosphere redolent with the garlicky odor of phosphorous and the breath of these patients was offensive from the same smell on the day after the inhalation. For some months after this very unsatisfactory brief experience my bromide of ethyl bottle remained corked. About this time great publicity was given to a death in the practice of Dr. Marion Sims, from ethyl administration, in which several ounces had been used, and the narcosis kept up for a long period. This was the first time that ethyl had been inhaled for anæsthetic purposes in New York City. This first fatal case was followed soon afterwards by a death under the use of ethyl in the practice of Dr. Levis, of Philadelphia These two fatal cases put a very sudden stop to the use of bromide of ethyl in the United States.

Confiding in the statements of Drs. Levis and Turnbull, both of them surgeons of large experience, that the bromide of ethyl had good properties, I was still disposed to beleive that the new and comparatively unknown anæsthetic possessed attributes which we had not succeeded in developing. I therefore again commenced experimenting cautiously with this new remedy. By degrees, as I became better acquainted with it, it secured my confidence. For the past year I have used it on an average at least once every day, often administering it four, five or six times, during the day's work in private practice and at the hospitals. Familiarities and effects, and the discovery of the proper method of administering it, has taught me to value its advantages more and more highly, till now I consider it *par excellence the anæsthetic* to be used for any painful surgical operation which can be quickly performed. *Having found out how to use it, and what to expect from its admin-*

*istration, I can obtain the most brilliant results from it, and have become quite enthusiastic in its praises.*

In every patient, using the needful precaution, I have produced complete narcosis in less than one minute, often in from twenty to thirty seconds. A deep sleep which, however, will not last more than one or two minutes. From this speedily induced narcosis recovery is rapid and complete, with neither nausea nor heaviness, so that as a rule five minutes after inhalation the patient is as much himself as if no anæsthetic had been used. Experience has taught me that these are the peculiarities of the bromide of ethyl when administered for anæsthetic purposes, and that as such they will prove of inestimable value to surgery.

The following very interesting cases, patients recently operated upon, will illustrate how thoroughly and speedily the brain resumes its full function after complete ethyl narcosis:

Miss M., a self-possessed little girl, eight years of age, desired to have an ugly squint corrected, and exhibited no timidity in witnessing the preparations needful for its performance. Prior to getting upon the table she had her collar loosened to remove any impediment to respiration. In doing so she took two roses from her dress and placed them on a vacant chair near by. She was then put on the operating table and the bromide of ethyl administered. A very few inspirations produced deep sleep, under which the tenotomy of the rectus muscle was performed. The ethylization and squint operation occupied fifty-six seconds. the time was taken by one of my assistants. Within three minutes from the commencement of the narcotism the child was perfectly awake, and was ready to get up from the table. When on the floor she walked at once to the chair and within four minutes from the time that the anæsthesia was commenced she was engaged in pining these roses into the front of her dress, with a composure which showed not only no present discomfort but a complete oblivion of the experience through which she had just passed.

*The second case*, also one of convergent squint, was that of a boy, fifteen years of age, who seemed very anxious to get rid of his deformity. After getting on the operating table, before the medical class at the University of Maryland clinic, I told him that when the towel was placed over his face it would have a very choking sensation, but that he could not choke from it. I also showed him how to take quick and full inspirations, so that the suffocative sensation would entirely pass away before he had breathed a half dozen times. When the folded towel, upon which a drachm of ethyl had been poured, was placed over his face, he commenced a most active respiratory movement, which in a very few seconds quieted down into a deep sleep. Within thirty seconds from the commencement of the ethylization narcotism was profound. The operation was commenced without delay and the division of the tendon speedily consummated. The entire operation from the commencing of ethylization to the perfection of tenotomy, did not exceed sixty seconds. A minute had not elapsed from the completion of the operation when he awoke, and jumping from the table to the floor of the amphitheatre he cried out in a jubilant voice, "I am all right," much to the amusement of the medical class who crowded the benches: a very different behaviour from that which follows the inhalation of chloroform or ether. In this case the entire period from the beginning of the inhalation, through the stage of complete narcosis, to perfect restoration, did not exceed two minutes.

A *third case* was that of a gentleman of extremely nervous temperament, was disfigured by a tarsal tumor. On account of his dread of being operated upon, he had carried this ugly swelling on his lid for over a year. One Sunday morning he presented himself at my office with the request that I would operate upon him at once, making as a condition that I would give him chloroform. It is an established rule with me never to administer an anaesthetic without an assistant being present. Having explained the necessity for

this course, I requested him to meet me at the University Hospital within an hour, so that I could secure the presence and aid of the resident physician as my assistant. I anticipated his arrival and had everything prepared for his coming. I received him on his entering the vestibule of the hospital and accompanied him at once to the amphitheatre. With no loss of time he got upon the table and was told to take full inspirations of the medicated vapor in spite of the suffocative feeling excited by the ethyl. As soon as the cone containing a drachm of bromide of ethyl was placed over his nose and mouth, he commenced a series of slow, deep inspirations, which terminated in full narcosis by the time the eighth inspiration was taken. His breathing was free, pulse strong, color of face bright, with appearance in every repect of ordinary, deep, natural sleep. Desmarres' ring forceps or clamp soon secured the lid, the tumor was freely opened from the conjunctival surface, and by means of a cutting spoon the epithelial lining of the cyst was speedily scraped off. A few rapid rotations of the spoon effected this very promptly. This manipulation was a matter of a very few seconds. The awaking was equally prompt. Within two minutes from the time he laid upon the table he was again standing on the floor. Upon being questioned he said that he was perfectly himself, and had felt nothing whatever of the operation. He asked whether all was over and when assured of it he put on his hat and walked out of the room. Within six minutes from the time of his arrival he was again passing out of the entrance door of the hospital into the street, having, during this very short period been ethylized, operated upon and resumed his natural condition of feeling.

I might go on enumerating case after case, until my entire experience with the wonderful efficacy of ethyl, in all cases of what I now call primary anæsthesia, was gone through with, covering at this time over 400 inhalations. These three cases, however will suffice to show how thoroughly the brain recovers its perfect function after the deep but

very transient impression brought about through the inhalation of the vapor of this potent agent. Persons who, only three minutes before, had been in such deep sleep that they were insensible to pain, now walking out of the operating room with a firm tread and with a clear brain.

On account of its activity, efficiency, and the evanescent nature of its narcotic effects, the bromide of ethyl has become my favorite anæsthetic for all surgical cases, in which, by quick manipulation, I can perfect a painful operation in a short period.

Experience, by daily administration, has taught me this very valuable lesson, viz., that the Bromide of Ethyl is not an anæsthetic which can be advantageously repeated or its inhalation be continued for any length of time. This is one of the serious mistakes which we made in our early experiments and which induce me, through ignorance, to discard the new agent as unreliable.

*Its wonderful action is obtained during the first minute of its inhalation and what I have called its primary anæsthesia.*

In cases, in which from some interference with the rapidity of the manual of operative procedure this primary anæsthesia wears off, and a second, and even more numerous administrations have to be made to keep up the anæsthetic state until the operation can be completed, while the narcosis can at all times be reproduced, nausea is very apt to follow. By this frequent repetition of the inhalation, a mental depression is established, as from the continued use of chloroform or ether, which may last many hours.

Fortunately there are many surgical operations of a very painful nature which can be perfected within the short period of a primary ethyl narcosis. Abscesses can be lanced, cysts emptied, sinuses laid open, wounds probed, strictures incised, muscles divided, ingrowing nails removed, surfaces cauterized, examinations made necessitating painful manipulations, and even amputations may be performed. It must not be forgotton that prior to the discovery of

anæsthetics, Mr. Liston urged the general adoption of flap amputations, because all painful cutting, including the sawing of bones, could be completed in so many seconds and did not require minutes at the hands of dextrous surgeons.

In Eye and Ear Surgery, in which I am now exclusively interested, the irritable eyes of children can be carefully and thoroughly examined, tumors can be removed from the lids, abscesses punctured, orbital sinuses explored, the lachrymal canals laid open, the nasal ducts probed, foreign bodies removed from the cornea, canthotomy practiced, crossed eyes straightened, the operation for artificial pupil perfected, ingrowing lashes destroyed by the cautery, needle operations for soft or capsular cataracts effected, and even optico-ciliary neurotomy completed. All such operations I perform now under a primary ethylization, if the patient exhibits any timidity or expresses a desire to be put to sleep. Cataract extractions, enucleations and many lid operations require more time for their safe performance than ethyl narcosis permits. If every preparation be made in advance, instruments arranged in the order in which they are to be used, and placed within easy reach, and if the surgeon is able to manipulate with dexterity, it can be readily seen that a very large part of the painful procedures of surgical practice might be made altogether painless by taking advantage of the wonderful nature of ethyl narcosis.

In Eye Surgery I not only use ethyl daily, but if deprived of it would feel that I had lost one of my very best assistants.

What can be more satisfactory than the correction of that ugly deformity, squint, under the perfectly quieting influence of the bromide of ethyl, in less than one minute, to cover ethylization and the tenotomy? In fifty-two seconds, as measured by the stop-watch, I have ethylized the patient and completed the division of the faulty muscle, The patient, quite himself in two minutes more, finds the ugly deformity gone, and without the slightest knowledge, on his

part, of how the wonderful transformation has been brought about. This was my first expeditious operation. In the presence of the large medical class of the University of Maryland I have repeatedly completed the entire operation for the correction of squint, including the whole time necessary for the administration of the anæsthetic, in less than sixty seconds, as measured by the stop-watch.

*To use the bromide of ethyl efficiently, one must have confidence in himself and also in the safety of the agent which he is administering.*

For long operations, or such as I desire to complete slowly, I prefer to administer chloroform, an anæsthetic with which I have had a long, extensive and uninterruptedly satisfactory experience. *Of over* 12,000 *patients, upon whom I have operated under the narcotic effects of chloroform, I have not lost one.* These patients cover organic disorders of heart, lungs, kidney or visceral disease, in persons of all ages, from the child only a few days old to my oldest chloroform administration, a very old man of ninety-six. Some were strong while others were very feeble. I never refuse the comforts of an anæsthetic to any person upon whom I have to operate.

Chloroform has always served me so faithfully that I have never had any good reason for transferring my allegiance to sulphuric ether. I now and then use ether but only at long intervals. Should a patient express any positive objection to chloroform and desire that ether be administered in his case, I always carry out his wishes. When the selection of the anæsthetic is left to me, and it usually is, my preference is decidedly for chloroform. I use chloroform so freely that I buy it literally by the gallon or in seven-pound bottles, many of which I have emptied. Of sulphuric ether I still have a pound bottle, which has been in my possession already five years, with contents not yet consumed. I believe that sulphuric ether is as safe as chlorform, but not more so. I know it to be more disagreeable in its odor and much more unpleasant in its inhalation I

believe that either chloroform or ether, when carefully given in accordance with well-known laws, which should always be observed in the inhalation of anæsthetics, will with few very rare exceptions carry safety in its train. I also believe that if proper care be not taken, trouble may come to both patient and surgeon regardless of the agent selected. Some physicians have much more anxiety while using anæsthetics than others, not because they have a worse class of patients, but because they have never acquired the necessary confidence in the article they use, nor do they feel the necessity, under conviction, of always having and observing fixed rules for their guidance in the use of these powerful agents.

After an experience of thirty years of an active surgical practice, I still hold chloroform to be the best of anæsthetics for tedious operations, provided certain simple rules are adhered to in its administration. I can enumerate them in a very few words.

1. I always, *without a single exception*, give a strong drink of whiskey, from one to two ounces, to every adult to whom I intend to administer chloroform. This is done a few minutes before they get on the operating table. Because I never omit this fundamental law, and in advance sustain the heart against the depressing effect of the anæsthetic, in not one of my 12,000 cases have I ever had to use, in a single instance, a hypodermic of whiskey. It is already in the stomach should it be needed and can do no harm if not required.

2. Always loose the neck and chest clothing so as to have no impediment to respiration.

3. Only administer chloroform in the recumbent posture with body perfectly horizontal and head on a low pillow, this pillow to be removed as the anæsthesia progresses.

4. Give chloroform on a thin towel folded in conical form with open apex so that the vapor, before inhalation, will be freely diluted with atmospheric air. In holding this cone over the face of the patient at some little distance from the nose, place the fingers under the borders of the

cone for the double purpose of allowing air to enter freely, and also to prevent the chloroform liquid on the towel from coming in contact with the skin of the patient's face, and thereby avoid its blistering effects.

5. Should loud snoring occur force up the chin. This manipulation, by straightening the air passages from the nose to the larynx, makes easy breathing. The forcible elevation of the chin is far better in every respect than pulling out the tongue. It is easier of application, more quickly done, requires no instruments and is much more efficient in removing the impediment to respiration.

By always following these five simple rules I have had, so far, both safety and comfort in the administration of chloroform.

Possibly one very strong reason, why I have been so successful in the administration of chloroform is, that as a specialist in eye surgery the inhaler must be removed from the nose before I commence the surgical manipulations. Besides, while operating, I have constantly in view both the color of the face and the respiration of the patient, which I consider even more important for the surgeon to observe than to feel the pulse. When surgeons are operating on distant parts of the body and cannot watch the work of the administrator of chloroform, accidents are most apt to happen.

In the inhalation of the bromide of ethyl all of these rules laid down for the establishing of chloroform narcosis are not necessary, and some of them cannot be followed out.

The recumbent posture I consider essential for the safe administration of any anæsthetic, whether it be chloroform, ether or ethyl, hence these agents are not safe remedies at the hands of dentists, who place their patients in a sitting posture. Preparatory to the inhalation of the bromide of ethyl I have not found it necessary to give whiskey. The only precaution I take is to loose the neck clothing and have the patient lie down with the head only slightly elevated.

*My experiments have taught me that the mode of administering the ethyl should differ totally from that used in giving chloroform.*

Instead of chloroform vapor freely diluted with atmospheric air, a saturated ethyl vapor must be inhaled, to the exclusion of atmospheric air, in order to obtain speedily and effectually narcosis.

In my early experiments with this new agent I had not yet discovered this fundamental principle, and hence did not obtain good results. I voted bromide of ethyl a failure, because in common with other experimenters, I was too timid, or rather I should say too ignorant of its peculiarities, to push the ethyl vapor in the concentrated form, which I have since found necessary to obtain good results. By my present method of administering it, I can obtain perfect ethylization in patients in from twenty to sixty seconds, and have no after consequences of nausea or dullness of feeling.

The best inhaler for the giving of the bromide of ethyl is a thick towel folded into the form of a small cone with closed apex. Between one of the folds of the towel I place a sheet of paper, which makes the cone nearly air tight. The base of the cone must be wide enough to enclose both mouth and nose. The soft material of which the inhaler is made enables the rim to be kept firmly in contact with the face, so as to exclude air from entering. I always instruct the patient how to make long inspirations, and inform him that he must do this, notwithstanding the fact that he will feel somewhat stifled. I also try to give him confidence by assuring him that a very few inspirations will put him to sleep. Usually I make him go through the process of strong respiratory movements in advance, so that he will know exactly how to proceed. Into this towel cone I pour about one drachm of the bromide of ethyl and immediately invert the inhaler over the nose and mouth of the patient, holding its edge down firmly over the face. There is no fear of creating asphyxia, as all air cannot be excluded,

and the height of the cone makes a considerable air chamber into which the patient breathes.

Children usually struggle to escape from the apparatus. *The cone, however, must not be removed from the face for an instant until anæsthesia is produced.* At first some patients will resist the breathing of the vapor, but there is no fear that they will not catch their breath in time. Should children cry, it only insures inspiratory efforts, which the more surely and quickly will bring about the introduction of the vapor into the lungs. As a rule, a dozen full inspirations are all that are needed to produce deep narcosis. I recognize this desirable condition by a stoppage of all struggling. I have had deep sleep brought on by the sixth inspiration, when complete relaxation ensues, with quiet breathing, and an absence of reflex irritation should the conjunctive be touched. The patient retains the usual healthy color of lips and cheeks as if in ordinary sleep, and the pulse becomes slower and stronger as the narcosis becomes profound. Thirty seconds, as a rule, is sufficient to bring about this desirable condition, and have the patient ready for operation.

I have not found this anæsthetic sleep last more than two or three minutes, often not so long.

Usually the patients awake suddenly and as completely as they would do from ordinary sleep. They are able to get down from the operating table without assistance and walk off without staggering, and with brain clear to answer correctly any question: in fact, quite themselves.

It took me some time to acquire such confidence in the safety of the remedy, as to apply it in the concentrated form needful to obtain its fullest benefits. To the uninitiated it looks like cruel work to keep the cone of a saturated ethylized vapor over the face of a struggling patient. *I am convinced, however, that in no other way can quick, complete and safe anaesthesia be obtained by it.* Fortunately the struggling is very soon over, and quiet sleep speedily ensues.

My experience with the bromide of ethyl will now exceed 400 cases, of which upwards of 300 are within the past year. I am beginning to be familar with its administration and its effects. *I now know what is to be obtained by it, and what not to expect from it.* I give it without hesitation, in any case, to

avoid painful manipulation. I have used it as often as six times a day, and I administer it, on an average, certainly once every day. In the last week I have given it fifteen times. For office use I find it invaluable, on account of its promptness, efficiency, evanescent nature of the anæsthesia induced, the abscence of nausea, and the perfect comfort with which patients operated upon can leave my office within a few minutes after the eythlization. Its use in my every-day experience does not interfere with the routine of office practice, nor occupy more time than I give to an ordinary office consultation, a very important desideratum to those who have restless patients awaiting their turn in the reception room.

Those who will use it by a single inhalation, to produce a short, deep sleep, and not resort to a mal-administration of this very valuable, powerful agent for a continued anæsthesia, which it is incapable of sustaining in safety and in comfort, will become as enthusiastic as I am over its brilliant results. They will in time learn to consider it, as I do, the most perfect of anæsthetic agents for quick, painful surgical work. It can never take the place of chloroform or sulphuric ether, where any heavy operations are to be done. These well-known and tried anæsthetics must continue in favor for all tedious operations, and will be used in minor surgery by those who manipulate slowly and who do not have prompt, quick assistants. But when one can take advantage of a primary anæsthesia, from the first administration of the bromide of ethyl, and having made every preparation in advance, will manipulate quickly, the new anæsthetic leaves nothing to be desired.

I will repeat, "can anything be more brilliant in surgery than a successful operation for squint, where an ugly deformity of years standing is promptly, thoroughly, safely and surely removed in less then one minute of time—fifty-two seconds for ethylization and operation ?" This is the nearest approach to magic in the art of surgery.—*Reprint from Md. Med. Jour.*

## ARTICLE II.

### *The Etiology of Dental Decay.*—(Continued.)

BY GEO. WATT, M. D., D. D. S.,

[Read before the Ohio State Dental Society.]

Because the specific acids, in producing caries are always nascent, as rapidly as atoms of any of them are formed or liberated, they take hold of the tooth substance, when generated or liberated in contact with it. And this renders it impracticable to find the specific exciting agent in any case of dental caries in an uncombined state. The camal was not seen; but the Arab knew it had passed his tent by the fresh tracks it had left behind it. The specific acids —the exciting causes of caries—are not seen, but their work and its results are plainly observable. When this doctrine is clearly in the mind, no one will be surprised to find the buccal fluids alkaline in mouths affected with rapid decay. In a majority of such cases the alkalinity is due to ammonia, which is a compound of nitrogen and hydrogen, and which is always formed during the putrefaction of azotized bodies, or whenever the vitality of such tissues is so low that it is not able to resist chemical action. And when ammonia is exposed to the action of oxygen, either nascent or quiescent, its nitrogen is burned or oxidized into nitric acid, and its hydrogen into water. The great affinity of the acid and the water for each other, Liebig calls a disposing circumstance, which he says increases the tendency to the oxidation. I am not unmindful that the paper I read before you last year was pronounced "partly antiquated," *partly* because it was according to Liebig; but a chemical fact in the days of Liebig is a chemical fact still, in despite of the opinions of juvenile chemistry. Those who are duly posted on the chemical theory of decay, and are, at the same time, wide awake, whenever they find a decidedly alkaline reaction of the buccal fluids, resort at once to a tonic and acidfying course of treatment, as they

know the great danger that white decay is likely to run a rapid career, unless the tendency is arrested. And their antiseptic treatment is not used by them for the destruction of germs, but to get rid of the tendency to the formation of nitric acid.

In the discussion of Prof. Spalding's paper in the society, Dr. Swain is represented as saying, "Twice during the year I have had in my office a harmlessly insane young lady. In her mouth I have found the saliva uniformly acid, but her teeth do not decay." What acid gave the uniform reaction we are not told; but it was probably the normal carbonic acid, and it was fortunate for her that ammonia was not found to neutralize it. It is unfortunate that such half-way observations and tests tell us so little; but when we think how busy and how tired the ordinary dentist is, we cannot be surprised.

But suppose the saliva, the mixed buccal fluid, is all the time acid, and that the acid or acids it contains are sufficiently concentrated to act on the teeth, nothing like the phenomena of any variety of dental caries can be produced. If the teeth are of uniformly good texture as to their entire external surfaces, these surfaces may be roughened, or corroded by the acids. Further on I shall endeavor to explain how the phenomena of caries are produced, in accordance with the so-called chemical theory, and I think no one will regard the results as at all mysterious.

A paper that has attracted some attention on both sides of the water was read before Section XII of the International Medical Congress, August 6, 1881, by Arthur S. Underwood, M. R. C. S., L. D. S., and W. J. Miles, L. R. C. P. Lond., F. R. C. S. and C.,

I regret the necessity to differ with such careful and such distinguished observers; but truth is truth, and men who, from their learning, have a right to exhaust the alphabet in the display of titles, may be mistaken on very small matters. Their paper has been variously published, but I am using it as it appears in the Journal of the British Dental

Association, where I first noticed it. It seems to require only moderate attention to see that these brethern have not clear ideas as to the " chemical theory " of decay. For example, they say, " With regard to the purely chemical theory, we cannot accept it as wholly satisfactory for the following reasons." Now I doubt if any educated dentist accepts the *purely chemical* theory, ignoring organic or physiological conditions as predisposing causes.

But a consideration of their reasons for non-acceptance shows a decided lack in their understanding of the so-called acid theory. They say: " 1. Because the destruction of dentine, effected by the action of acids alone, under a septic condition, does not resemble caries, either in color or in consistency, it being colorless and gelatinous, the process uniformly attacking all parts of the surface.

They refer to the useless experiment which our boys used to call " tooth pickling." Putting dentine to soak in, say hydrochloric acid, the lime salts will be dissolved, and the gelatin will be left. But the acid is quiescent, and not, therefore, in the condition necessary for the imitation of caries. They are enveloped by the same cloud which overshadowed Prof. Spalding. In their third reason they gravely tell us: " Further, our own flasks show that maliac and butyric acids with saliva in a meat infusion, have not, under aseptic conditions, produced caries." Most certainly not; for these acids never did, and never will produce dental caries under any conditions. Chemical action is definite; and where but a few reactions are observable, as is the case in caries, but few, and just as few, reagents are concerned in the production, and butyric and malic acids are not two of them. They say, too, in this connection, " that acids alone do not alone destroy a living tissue;" and they apparently try no enforce the statement by the remark, " that the stomach is not digested by its own acids until it has been removed from the body." But they surely do not mean to include sulphuric, nitric, hydroflouric acids, and the like, in their statement that " acids alone do not destroy a living tissue."

I will quote the fourth reason in full, and think it is plain that their inferences are not legitimately drawn, while the closing remarks show that they have no true idea of the position held by the advocates of the acid theory. They say: "4. Lastly, we would urge that, when caries occurs in the mouth, it is always under circumstances more favorable to the action of the germs than to that of acids. There is always, first of all, a minute pit or haven where germs can rest undisturbed and attack the tissue. We cannot, upon the purely acid hypothesis, explain why the same acids that originally caused the decay, gaining access through some minute imperfection of the armor of the enamel, do not in the same mouth, or under the same condition, attack the wounded enamel at the edges of the filling. The germs cannot rest there, they are constantly washed away if the surface is fairly smooth; but the acids literally bathe the part except during the performance of the act of mastication, when the alkaline parotid and submaxillary saliva neutralizes their action."

Now can any one believe that "a minute pit or haven" is a better place for the development of germs than for the formation of acids? And the germs are always washed away from the edges of the filling while "the acids literally bathe the part." Why do not the germs "stick in their holders," as the Irishman did when trying to ride the mule? They need not be washed away if they are like Prof. Mayr's little pets, able to crawl through the holes in normal enamel. (But they do that just to show Prof. M. how small a hole can be crawled into rather than give up a favorite theory). Their allusion to the acids bathing the parts show that they have not caught the first idea in the acid theory of decay. They are bemixed in the slough of quiescent acids, with Prof. S., whom we quoted at the outset. But if a nascent acid is to cause caries, it needs the "minute pit" for its development more than do the germs, It is very difficult to form, either by synthesis or analysis, a nascent acid at the junction of a well-finished filling with the border of the cavity.

But having got thus far, these gentlemen find their progress arrested, unless they come over to the acid theory. Hear them : " Most probably the work of decalcification, is entirely performed by the action of acids, but these acids are, we think, secreted by the germs themselves." " *We think*," is good. But what acids do the germs secrete? Chemical action is definite, and but three or four kinds of " decalcification " occur in dental caries.

Time and space will not allow a notice of all the points assumed by these brethern. Let me notice an item or two in their summary. They say : " 1. We consider that caries is absolutely dependent upon the presence and prolifications of organisms. That these organisms attack first the organic material, and feeding upon it, create an acid which removes the lime salt." First they beg the question, —at least we may claim the Scotch verdict of " Not proven "—and then they *guess* the little bugs, or buggers, create an acid. Well, what acid? In the experiments, occupying over ten years, with results reported nearly a a quarter of a century ago, I was not content to guess at the acids. True, in the most common variety of dental caries I did not find hydrochloride acid dissolving the sulphosphate, and decomposing the carbonate of lime, for the acid being nascent, each atom was saturated as fast as formed ; but I did show chloride of calcium pressed out of the softened organic matter remaining in the cavity, and precipitated bone phosphate from solutions obtained from similar cavities. If I didn't exhibit the dragon, I showed his tracks. And instead of the organic matter being first attacked, as those brethern claim, much of it is often found in the cavity, and so little disturbed as to distinctly show its organic structure. And Prof. Mayr, finding the lime salts present in an entirely different form of caries, does not in the least contradict this statement.

Further in their summary they say : " 2. That suppuration of the pulp and its sequelæ, such as alveolar abscess, depend also upon the successful working of organisms."

This claim is now common, and was made, in noticing one of the *Journal's* Specials, perhaps, by Prof. Mayr, he going so far as to claim, if my memory is not treacherous, that no one had ever held that such action could originate except through the action of germs. The position is held by many of my friends, and by distinguished men for whom I have the highest respect; but they are in error nevertheless. This may appear from various considerations, but, first look at the following: The *British Medical Journal* not long ago said this: "A contribution of great importance will be found in the October number of Virchow's *Archiv.* Dr. Uskoff, of Cronstadt, has made experiments which appear to prove that suppurative inflammation can occur independently of micro-organisms. He injected small quantities of distilled water, milk, oil, pus and turpentine into the subcutaneous cellular tissues of dogs, and examined the tissues microscopically a few days later. He found that the injection of bland fluids, such as water and milk, caused no suppuration, provided that only a gramme or two was injected, but that large abscsses formed when several grammes were introduced. The injection of turpentine, especially when not diluted with oil and carbolic acid, produced, in most cases, large abscesses, containing pus, which was entirely free from micro-organisms. From this, Dr. Uskoff, concludes that, although micro-organisms may, in many cases, be the proximate cause of suppuration, morbid process may exist entirely independently of them, being due to chemical irritation, as when turpentine is used, or to damage of tissues, as in cases where a considerable amount of water is forcibly injected. We intend shortly to refer, at greater length, to this important subject."

Few stand higher than does Dr. Uskoff as an exerimenter and close observer. Years ago, without any knowledge of other researches in this direction, the writer very carefully conducted a series of experiments, with direct reference to this subject, which fully confirm the conclusions

arrived at now by Dr Uskoff. The record of these experiments, conducted mainly at No. 55 W. Seventh Street, Cincinnati, was destroyed by accident. In many of them I had the counsel and assistance of the late Prof. Thomas Wood, whose name is a guarantee of accuracy.

I had also the coöperation of the late Prof. W. H. Mussey, who, although quite too busy to give immediate personal attention, gave most valuable suggestions as to the methods of conducting the experiments, especially with reference to securing aseptic conditions of the appliances used. The hypodermic instruments used were rendered aseptic partly by heat, and partly by carbolic acid, etc. Distilled water and other agents, free from micro-organisms, were introduced into both cellular and muscular tissues of human beings, dogs, etc.; and when it was ascertained that suppuration had taken place, aseptic conditions being still observed, with the hypodermic instrument, pus was drawn out and found entirely free from micro-organisms. This is but a flimsy account of the experiments of prof. Wood and myself. And while I have never made a claim to be an expert with the microscope, still I think I could see a beetle or a June-bug, if in full view. But Prof. Wood had few superiors in this line. Had it not been that his native modesty held him back, he would have been recognized according to his merits. It is more than gratifying to find the researches of Dr. Uskoff confirming the teachings of our experiments of 1867 and 1868, which I had repeated, as opportunity served, many times since, and usually, when on human subjects, taking the precaution to steal up the orifice made by the hypodermic point, with collodion. Prof. Wood and his son are both dead, and it is not probable any notes of these experiments can be found among his papers; and I am not sure that he took notes of them. He took none in our nitrous oxide investigations, relying on his very tenacious memory.

If I had not implicit confidence in the testimony of these experiments, they would not be here referred to, and though

it is a delicate subject, you will allow me to allude to the fact that my physical disability has given me ample leisure to experiment, and a few of you know that the time has been improved.

A carefully prepared paper was read on "The Etiology and Pathology of Dental Diseases," at the annual general meeting of the Association at Liverpool, by Henry Sewill, M. R. C. S., L. D. S., England. In reference to caries he says: "Caries must be defined as a process of disintegration, commencing invariably at the surface, and proceeding inwards, affecting dentine more rapidly than enamel, and due entirely to external agencies. We are now positively assured of the truth of these facts; that caries is not an inflammatory change, that it does not depend upon any connection, vascular or nervous, with the rest of the body, and that caries may occur even in an extracted tooth, which is retained in the mouth by artificial means, as on a denture or pivot."

Further along he says: "The active agents in caries are, acids and living organisms." The acids, maliac, buytric, and acetic, are the products of chemical change and fermentation set up in fragments of organic matter, food, mucus, and epithelial scales, which are commonly present in the mouth."

A casual remark often shows an opinion or an error as well as a labored essay could. Mr. Sewell has this remark: "That the acids alone do not produce all the phenomena is obvious from the fact that dentine, after perforation of the enamel, is the favorite seat of caries; whereas acid acting alone would most rapidly attack the enamel. It is equally inconceivable that micro-organisms could gain access to the dentine without the assistance of an acid capable of perforating the enamel." A little further on he says: "The initial stage of caries undoubtedly depends greatly, if not entirely, on the action of acid, and this stage, let us note particularly, may be induced artificially by introducing a pellet of cotton wool between two teeth and allowing acid to collect in it and to act upon the adjacent enamel."

In the first quotation here the writer has forgotten that enamel is much harder than dentine, and that cohesive attraction is one of the modifying circumstances of chemical affinity. Marble and chalk are chemically the same, and an acid acting on them yields alike results; yet it acts with much greater energy on the chalk, simply because less cohesion is to be overcome. This quotation, too, shows, that the writer fails to recognize the facts that acids are nascent when they cause caries directly. The experiment with the pellet of cotton wool is instructive; but if he had said "allowing acid to" be *formed* in it rather than to collect in it, he would have been nearer to the correct idea.

The writer is troubled about the color of caries. The black variety is not mysterious. The organic matter is "carbonized," as is a cork sometimes, by sulphuric acid; and animal charcoal is black. And if we take the most common variety of caries, when recent, it is the color of the gelatinous portion of the dentine. This remaining is gradually darkened by oxidation, just as decaying leaves, etc., are darkened from the fact that their carbon is more slowly oxidized than are the other constituents. But I have dwelt too long on this paper, and so it must be abandoned for something later, though some of its other points are worthy of notice.

The last paper it is proposed to notice, in this connection, is from the pen of Dr. C. T. Stockwell, of Springfield Mass., and is entitled "Etiology of Dental Caries. Acids, or Germs; Which?" It was read before the New England and Connecticut Valley Dental Societies, October, 1882, and is, accordingly, up with the times in reference to the principles held by the author.

It is feared that Dr. S. is not well up in the history of professional opinions, for he calls the acid theory, or rather, I suppose he means, the chemical theory, "the old dusty creed," when really it is quite new, never thought of, perhaps, till within the memory of some now living; and the other theory, viz: that dental decay is caries, similar to

caries in other bony tissues, has been held ever since the dawn of medical science. Which is old? Which is dusty? Instead of labelling the chemical theory "reopened for further investigation," as he advises, he would better inquire as to the success of the colored brother who tried to resurrect his dead sheep by inflating it with his own breath through a goose quill. The revival is about as likely to occur in the one case as in the other. Not many are likely to believe that dental decay is an ulcer, even though all the force of the *New England Journal* shall continue to eulogize Prof. Mayr, who is trying to revive this almost obsolete idea. Dr. S. tells us that "This conclusion of Prof. Mayr is based upon a study of chemical facts in relation to dentistry covering several years, during which a large number of experiments and chemical tests have been made in which it was found in every case 'that the lime salts are only slightly diminished in the decayed mass compared with the healthy tissue."

Now which variety of decay? Here are experimenters eulogizing each other, and yet so much in the dark that they regard it as of no importance in detailing experiments to give the principal facts. No one expects to find the lime salts removed from black decay, if he has studied the chemical theory; nor does he expect to find the reactions of acetic acid. But Prof. M. seems to think a mare's nest (no play on words) is found because he finds the lime salts, without acetates, in a case of black decay. He did not intend to tell us that it was this variety of caries; but the fact slipped out.

Dr. S. boasts of the "several years" of Prof. M.'s researches in dental chemistry. How many make several? Not very many, as we know; but Prof. M. will not allow that to count, for he insists, if I understand him, that all the long years of Prof. Buckingham's researches amount to nothing. What great discoveries has Prof. M. made in these several years? Great results ought to be heard of, especially since Dr. S. places in his hands nearly every

tooth he extracts, and as he extracts sixteen at once, or in a brief period. But again let me remind you, that neither Dr. S. nor Prof. Mayr seem to know that there is more than one variety of decay, though as you all know, the black and white decays are not more alike than a boil and a blister. Only last week a man with heavy gloves on, raised his hands and said to me, "Doctor, my hands are sore. What shall I do for them?" He is from New England, and was definite in describing his hands as are these men in describing the decay of the teeth.

But I asked as to Prof. M.s' great discoveries. Here is one: "The tooth will be destroyed if either the *outer* forces become too strong relatively to the *inner* forces, or if the *inner* forces *become too weak.*" Further down he says, "About the septical theory and its principles there is no longer ignorance among us. We may consider the facts settled. But why does not healthy tissue become attacked like diseased tissue? To explain the fact, we have again to go back to the simpler forms of bioplasson to amœba. Amœba may live in water containing bacteria; but scientifically, the bioplasson of the bacteria becomes a part of the bioplasson of the amœba, the latter being in excess and a more staple compound. The same will happen to a tooth; *bacteria may enter healthy enamel;* their number, from the great density and closeness of the net-work of the enamel, is only small at one time, and the fibrils within, being on guard, so to say, do nothing more or less than dispose of the entering bacteria, by way of *assimilation.* Thus, as long as the fibrils prove stronger, the bacteria will not gain entrance; but let the fibrils become weakened and they will crowd in. The danger of a part of the enamel being taken away lies in the fact that the dentine, being provided with much wider canals, the bacteria may enter in much larger number, and thus overpower the fibrils of the dentine."

I have quoted this at great length. It is either the best specimen of sharp-looking extant, or it shows what small

holes things will crawl into for sake of a pet theory. Prof. M. has found a hole to retreat into, smaller than those in the enamel through which the bacteria crept. Even Dr. S., though his eulogist, seems discouraged about following him through the little holes. He says, "The statement of Prof. Mayr, also regarding the possibility of bacteria entering 'healthy enamel's seems, in the light of these investigations, to be less visionary than many have supposed."

Why speak of the *possibility* of the bacteria entering healthy enamel? Prof. M. teaches us they "may," and that there is nothing to hinder, except when the "fibrils" are strong, wide awake and a little hungry, they eat the little buggers as fast as they go in, which is hardly fair play. They ought to let them get fully within, and then stand up in a fair manly fight.

Some have stupidly (?) thought the enamel is a protection to the dentine beneath. It seems the fibrils are the sentinels on picket duty—"being on guard," as Prof. M. puts it. Dr. S. speaks of the entrace to the tubuli being barricaded mineral substances; but what a mistake, when Mayr's bugs crawl right through them. The fibrils are the barricades; and a course that tends to invigorate them and sharpen their teeth, is the proper prophylactic treatment. Nor is it a mistake, as has been intimated, to put in the limesalts, even if acids are the main source of danger; for the teeth were made to grind the food, and fibrils would not answer. Besides, in the structure of the human body, all is made with reference to life Nature has not formed the human frame for death—has made no provision for it.

Near the beginning of this paper I spoke of optical delusions, and that the tendency heretofore increases in proportion to the squares of the powers used. This may explain the many contradictions. They are very abundant with the advocates of the germ theory who claim to tell just what they have seen. We have room to notice but one now: Dr. Miller of Berlin claims to have specimens "bored through and through" by leptothrix, as well as by

other micro-organisms; while Dr. Sewill, of England, says the leptothrix "never penetrates below the surface." I am tempted to add that Dr. Sewill says "it is inconceivable that micro-organisms could gain access to the dentine without the assistance of an acid capable of perforating the enamel," while Prof. Mayr sees the little fellows walking right in and playing the mischief, if the fibrils happen to be in delicate health. Seeing the bacteria going right through healthy enamel is the greatest discovery of modern microscopy. Some, who are naturally incredulous, will doubt the statement; but all such will incur the criticism of the *New England Journal*, with its six or eight editors, one of them "scientific." Therefore, be cautious.

Dr. S. seems to think that the chemical theory is squelched because alkaline mouthwashes, etc., fail to serve a good purpose "Acid agents would serve a better purpose," he says. Well, what of it? Can you not bear me witness that in the journals, and before this society, and though an earnest advocate of the chemical theory, I have perseveringly and persistently urged the use of acids as preventitives of decay? Do not Drs. Rehwinkel, Jennings, and others recall my eulogy of saur-kraut for this purpose? How many of you have given me the pet name of "Old Pickle," on account of my almost continually calling your attention in this direction? Was this a symptom of abandoning the chemical theory? Nay, verily! Dr. S., further down, tells us that an alkaline condition of the saliva is as productive of *a certain class* of germ development as an acid condition is of *other* classes." But he seems to care nothing at all whatever for the cause of the alkalinity; but as that condition of the buccal fluids is often, if not generally, caused by ammonia, you will bear in mind that this is a frightful precursor of the most destructive form of dental caries. And in this connection, he urges the importance of correct diagnosis, yet gives it so little attention himself that he seems not to care as to the cause of the alkalinity, nor as to the variety, of caries to be considered.

Dr. S. also quotes from Surgeon George M. Sternberg, of the United State army, "as an indorsement of this position of Prof. Mayr," leaving us to infer that the position to be indorsed is the statement that "bacteria may enter healthy enamel," a position which Dr. S. himself intimates is somewhat "visionary." But the main point in the quotation from the Surgeon is that when vital resistance of tissues is reduced the parasitic organisms can overcome them more readily; but that proves nothing for the germ theory, for as vital power is reduced, chemical affinity acts with greater relative power; for who does not know that vitality is one of the modifiers of chemical force?

Dr. S. tells us that he is "quoting Prof. Tyndall in substance," in saying that if any putrefactible substance is excluded from the air, or if it is exposed to air from which all germinal matter is excluded, no putrefaction will occur. "In other words, no germs, no putrefaction;" but this is flatly contradicted by the experiments of Dr. Uskoff already quoted, as well as by the very careful experiments of the late Prof. Thomas Wood and the writer, as referred to in this article.

But the fearful length of this paper, and nothing else, prevents a reply to every position of Dr. S. adverse to the chemical theory of decay. The remaining ones are more easily answered than are those noticed. One remark of his will yet claim attention and then his paper must be dismissed. He says: "Our attention in the past, has been directed too exclusively to simply the inorganic portions of the teeth. It has been the decalcification of the teeth, the *non-vita limesalts, etc.*, that has (have?) absorbed our attention to the exclusion of a proper conception of the vastly more important part that *protoplasm* plays in the life and existence of these organs,"

Now who has been slighting the organic materials of the teeth? I know of no prominent writer who has advocated the chemical theory of decay who has not stated the action on the organic, as clearly and as fully, as that on the

inorganic portions of the tooth, when describing the action of the exciting agent in each of the varieties of caries. In Watt's Chemical Essays, in the articles "Thoughts on Caries," and "Chemistry of the Mouth," I know this will be found true. (See Appendix to Taft's Operative Dentistry.")

With some thoughts on the nature and circumstances of dental decay, this long paper must close.

Many are puzzled to know why caries is found in definite spots, if the chemical theory is the true one. Let it be borne in mind that the acid immediately causing the decay is always nascent when doing its work. Many reasons explain why it is generated, or liberated at particular points. Then the microscope reveals places in both enamel and dentine imperfect on account of imperfect organization. These points yield to chemical action much more readily than normal structure; and this is one reason of the definite position of caries. And now suppose the exciting agent has, through a defective spot, got within the enamel, it acts on the dentine, and is not readily washed away by the fluids of the mouth, or even by the brush. Take, for illustration, a case of white decay. The exciting agent is here able to break down all tooth tissue. It acts on the inorganic a little more readily than on the organic. It does not form with tooth material, as highly soluble compounds, as does the agent, or agents, in causing chemical abrasion. The destroyed tissue will, in part, remain within the cavity of decay, but most of it can be wiped away with lint, or washed away by a stream of tepid water. Not nearly so much of the decayed material can be thus removed from a cavity formed by the colorless, or brown variety of caries.

Now, for the present, assume that white decay is immediately caused by nitric acid, and that this acid is formed by the oxidation of ammonia. As ammonia is composed of nitrogen and hydrogen, its oxidation results in nitric acid and water, Liebig and other authorities state that it is always thus oxidized in the presence of free oxygen. And

if it was in Liebig's day, it is now. Remember, too, that ammonia always results from the putrefaction of nitrogenous organic compounds. Suppose an atom of nitric acid has got through the enamel—not through the hole that Mayr's bug goes in at—but through a defective spot. It acts on the dentine—faster on the lime than on the gelatin. A thin layer of the lime salts is dissolved and of course a thin layer of organic matter is left. By putrefaction it gives ammonia, to be oxidized into nitric acid, to dissolve more lime and expose more organic matter, to putrefy and give more ammonia, to be oxidized into more nitric acid, to dissolve more limesalts,—and thus, on and on, till the pulp cavity is reached. Such is white decay.

Now, is the presence of germs necessary to explain the burrowing found in this variety of caries, as is claimed by the germ theorists? If Dr. Sewill is right, that leptothrix are found only on the surface, they cannot burrow, as can nascent nitric acid manufactured on the spot, and getting into its work as fast as it is generated.

We might illustrate the most common, and the black decays in a similar way, but time, space and strength rebel.

A President of the Theological Seminary was asked by a somewhat alarmed pupil if he thought that Christianity could stand up against the present teachings of science. The calm old President asked: "What are the present teachings of science? I have not read the dailes this morning." It would be well for the germ theorists to agree on some general principle before asking us to abandon attainments made by years of research, and the most laborious and carefully conducted experiments. I have already alluded to the great liability to mistakes when using high powers, and that this liability increases in the ratio of the squares of the powers. Some of you remember the bitter disputes at the meeting of the American Dental Association, in Boston, in 1866, if my memory is correct, the basis of the disputation being, not principles nor deductions from observations made, but a simple disagreement as to what was actually then seen through the microscope.

And now we have a fresh illustration that these modern microscopic researches are to be taken with a good degree of allowance. I refer to the so-called discovery of Koch, who claims to have found out that tubercle is caused by a living parasite—the bacillus. Vast numbers claiming to be scientific, jumped with delight, showing a credulity worthy of marines and gossips, when this announcement was made. But now comes the *Chicago Medical Journal*, with the statement that it will soon publish an article by Dr. H. D. Schmidt, a distinguished microscopist of New Orleans, who claims that this bacillus is not an organized body, but a fat crystal. Dr. Schmidt declares he can produce, artificially, every form of Koch's bacillus. So again we see that chemistry is no exterminated by micro-zoology; but the point is the uncertainty of these high-power observations.

This paper is far too long; but I have felt it advisable to aim at covering the whole ground of disputation now, fearing I might never be able to resume and finish up, if a part were postponed. And though mainly written during a period of extreme physical suffering, I hope it will be read with profit.—*Ohio State Journal of Dental Science.*

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## ARTICLE III.

### *Cells and Their Relation to Organisms.*

BY GEO. A. PIERSOL, M. D.,

A Lecture delivered before the Longford Scientific Association.

While the hope to discover the essential principle of life formed a never failing spring of inspiration and stimulus to ceaseless labor and speculation on the part of those ancient philosophers, whose acuteness and accuracy, even now excite our wonder and admiration, and while in the domains of mathematics, physics, and astronomy their labors were frequently crowned by the demonstration of thruths, which

the elapse of ages have rendered but still more indisputable, yet to those never tiring workers the true minute structure of the tissues—the seat of those vital phenomena, whose explanation was so earnestly sought—remained as deep and unravelled a mystery as the Elixir Vitœ.

The earliest magnifying lens—if indeed it can be called such—is probably that exhumed from the palace of Nimrud; it is of rock-crystal, rudely shaped, and probably was never used for optical purposes. Aristophanes tells us that "burning sphere" were sold in the shops of Athens nearly 500 years before the Christian era, but, nothwithstanding a long acquaintance with lenses, and some of their properties, there is no evidence that they were employed for investigation; not until long after in the 17th century, when in 1656, Borrellus won for himself the distinction of being the pioneer histologist, by, probably, first applying the microscope to the revelation of the structure of animal tissues. To Leeuwenhoek, however, over a century later, must be applied the title of "Father of Histology," as he was the first who instituted a systematic examination of the various tissues aided by this instrument.

About this time numerous observers had entered the field of microscopical research, the accuracy of whose deliniations of objects, in some instances, to-day stand unimpeached, while the explanations and interpretations accompanying may be even absurd in the light of our present knowledge.

While the descriptions of structures as seen under the instrument were rapidly accumulating it was not until about the middle of the 18th century, that we find the proposition advanced that the tissues are formed from ultimate elements, corresponding more or less with the ultimate particles of the inorganic world.

About 1760, Haller declared that all tissues were resolvable into primary units, and these he declared to be the "fibre" and "organized concrete," assigning, however, to the fibre the more important role. This "fibre" theory was quite generally accepted until the close of the century

when a reaction by the advancement of the "globular" theory, gave the signal for a contest which waged with vigor for nearly sixty years, during which time the names of those then mos tfamous in the study of natural history were drawn into the mælstrom of contention.

It was, however, reserved for Schleiden and Schwann, about 1837, to announce these observations by which it was demonstrated that all tissues are built up from "cells" formed after an uniform methed; this was first pointed out by Schleiden regarding vegetable tissues, and almost immediately applied by Schwann to animal structures; the investigations of these observers thus lying the foundation for our modern cell doctrine.

Without pausing to discuss the interesting consideration regarding the individual parts of the cell, as presented by these authors, we may briefly sum up the typical cell as conceived by them as being a closed vesicle always enveloped by a distinct membrane, containing more or less fluid cell contents, in which almost invariably was found a smaller, eccentric round body, the nucleus, containing within itself a third minute body, the nucleons. Of the cell, the nucleus and the nucleons were considered to be essential parts, especially the nucleous from which the cell had its origin and began i's growth, the nucleous and cell-contents being subsequently formed in their respective order.

Without considering the gradual evolution of our present views regarding the cell, in the modern conception of the physiological elementary unit, a cell may be defined in the langnage of Prof. Tyson, as a minute "mass of living matter possessing the essential life properties of reproduction, nutrition, growth and development."

The typical animal cell is represented by the ovum of the higher mammalia. Under the first microscope we have such a cell. Constituting it, we notice a cell-wall, or limiting membrane; cell-contents, in which is embedded a nucleus, in which further is seen the minute nucleous.

While this ovum presents all the parts of the typical cell, yet they, by no means, are always present, and, indeed, we shall see that in accordance with the definition adopted, all saw the cell-contents may be wanting, and still the structure is embraced in the term cell.

The cell-wall is generally absent: in many cells, however, there appears to be a peripheral hardening of the cell-contents, which thus forms a kind of envelope, denser than the ordinary cell-contents. The latter is usually a soft, semi-fluid albuminous substance, more or less clear and homogeneous and containing numerous fine particles or granules, which latter may be colored thereby giving a decided tinge to the cell, as is here seen in the so-called pigmental epithelium of the retina.

Regarding the "granular" appearances of the cell-contents, as well as of the nucleus, as usually described, it may be mentioned that during the last few years, largely through the labors of Heitzmann, Klein, and Flemming, as well as of many other observers, this "granular" appearance is claimed to be the expression under low powers of very delicate networks, which exist; the cross-sections and points of intersection of the fibres of which producing the well-known granules.

The nucleus, which is usually present, presents a more densely granular appearance, and possesses the property of taking a deeper coloration than the other parts of the cell on the addition of many coloring solutions, as those of carmine, logwood, and many of the aniline dyes. The so-called nucleolus is variable in its presence, being probably less frequently seen, that satisfactorily demonstrable, according to the views of Klein, the appearance represents no real separate part of the cell, but only a condensation or thickening of the delicate net-work, which, as just stated, by some observers is claimed to exist normally in all cells, especially in the nucleus. We have never been able to accept this explanation of the nucleolus. That in many cells this structure is absent, or at least but questionably

present must be admitted, but, on the contrary, it is difficult to believe that the beautifully distinct nucleoli, as seen in nerve and epithelial cells, are but shrunken and aggregated fibrils; while the decided difference in color from that of the nucleus as seen in tissues doubly stained, and even in gold preparations strengthens the conviction of the reality of the nucleolus as a distinct part of the cell.

The different parts of the cell vary in regard to their relative vitality, and they, doubtless, are probably different in chemical composition. If we stain any typical cell with a solution of carmine not all parts of the cell take the dye with equal intensity; the nucleus is more deeply stained than the remaining parts of the cell—the cell-contents. This property of appropriating with avidity carmine and allied dyes is peculiar to those parts possessing the greatest vitality—the "living-matter," the "germinal-matter," or the "biophlasm." If we take a cell from the surface of a mucous membrane, as that lining the mouth, and stain it, we will find that but a relatively small part of the cell becomes deeply colored, that part being the nucleus, while the cell contents takes but a faint tinge of color. Such a cell is shown under the microscope. The nucleus is here alone the living matter or bioplasm of such a cell. Now age greatly modifies the amount of the living-matter present in the cell. In the case just cited of the epithelial covering of mucous membranes, the deeper layers represent the youngest cells, on examining cells from these, the nucleus, which represents the bioplasm, is found to be relatively much larger than in the old, mature cells: there we saw the living matter very small, here the nucleus occupies the greater part of the entire cell, and it is also to be noticed that even the cell-contents take a deeper tinge than in the old cells. Of this difference in the intensity with which the parts of the cell stain according to age, advantage is taken in determining the relative ages of cells—the farther removed from youth the less the amount of living-matter, and the less intensity of the color.

Now while cells, as a rule, are formed but in part of bioplasm, some cells are composed entirely of the living-matter, as the white blood corpuscle and the so-called indifferent or lymphoid cell: in these we have not only deep coloration on staining, but also actual manifestations of life in the changes in form and place, which may be observed readily under favorable conditions, and which, from their resemblance to those of that primative organism and amœba, are known as amœboid movements.

Reproduction, it will be remembered, was one of the vital phenomena attributed to cells in our definition, and in it we have presented the most important role of the unit. Schleiden and Schwann. while recognizing much of the life-history of the cell, believed they originated often spontaneously; Virchow, however, later announced the truth that every cell is derived from some previously existing cell, formulating the now classic phrase *omnis cellula e cellula*, derived from the older formula *omne vivum ex evo.*

Cells reproduce and multiply their kind by several modes.

1st. *By fission* or division; in the simplest case dividing and setting free a portion of themselves as new cells capable of all the functions of the parent, as often takes place in those cells which are almost wholly of bioplasm, as the white blood-cells: the more usual mode by fission, however involves the nucleus. The nucleus first elongates, becomes constricted, and finally separates into usually two—sometimes more—portions, which separation is subsequently followed by a corresponding cleaving of the body of the cell, thus eventually giving rise to two or more distinct cells instead of the original single one. Under the instrument his is well exhibited in the growing cartilage of a young frog.

2nd. *By gemmation*, or a process of budding, as is illustrated in the growth of the yeast plant under the next microscope;

3rd. *By endogenous multiplication*, where we have a new progency of cells formed within the parent cell without

a division of the body of the original cell: this is shown under the instument. The last two modes of reproduction, however, are very much less common in animal tissues than the first.

During the last few years our knowledge of the method of the division of nuclei and cells has been largely extended through the elaborate studies of Strassburger and Flemming, and subsequently by many other observers. According to these researches the process of division is far from being the simple changes heretofore recognized, since the study of the changes taking place in the elements of the dividing nucleus—Karyokinesis—reveals a far greater complication that before supposed. These researches, by the way, are among the practical triumphs of recent objectives of the widest angles as rendered possible by the introduction of "homogeneous" immersion fluids; to the superb definition of such lenses, as made by Zeiss, Tolles, Powell and Leland, Seibert, and others, all bear testimony.

Having thus briefly considered the chief characteristics of the cell, let us discuss its relation to organisms and the modifications to which it is subjected in the course of higher development. It need not be said that to highly developed animals the individual cell bears but a very insignificant relation to the whole, but as we decend the scale of life we find the cell assuming a more and more commanding position, until in the lowest stage of life, the cell constitutes the entire organism. Under the microscope we have an amœba, which in its quiescent stage is but a single cell, generally round and mostly with a nucleus; in its more active form the vital phenomena are most marked, the organism improvising such special organs as may become necessary for the performance of its functions. A little higher and we find in the "sea-jellies," which abound in tropical waters, a number of cells necessary to the perfection of the individual; and as the animal scale is ascended, we find a greater and greater number of cells taking part until in the organism are untold millions, each contrbuting,

its part to the formation of the perfect whole: in addition as we advance, division of labor takes place, producing modification of structure for specialized function—certain cells become modified to perform certain and exclusive duties.

In the history of the development of the higher animals, there is a period when no morphological difference exists between the cells composing the germinal mass; soon, however, certain layers are formed, which further and further develop until from a mass of cells undistinguishable in their similarity, we have cells produced as different in appearance and function as the large ganglionic cells of the spinal cord, and those of involuntary muscle. Under the succeeding microscope is a section of an early embryo chick, in which, while systems and organs are beginning to be mapped out with some differentiation of the cells, yet they all present a marked similarity.

As has been already intimated, the form of the typical free cell is round, this brings the usual form of the youngest cells: where, however, they become crowded together in their development they exert mutual pressure, and the curved surfaces of contact give place to straight ones, thus producing the polygonal figures so characteristic of some forms of the covering of mucous membranes—epithelium. Other cells are never subjected to pressure, and are developed according to their intended function into spindle, multipolar, and other forms.

The slides under the succeeding microscopes will serve as illustrations of the changes in form which cells undergo from being the embroyonal indifferent element.

First, we have those which may be called cells *of nutrition*, as represented by those of the blood and lymph: here but comparatively slight change has taken place; most markedly in the red corpuscles, scarcely at all in the white blood-cells, which are considered as identical with those of the lymph, and which are the normally present type of the embroyonal cells, which they closely resemble,

Secondly, *cells forming coverings.* 1st of the *integument,* 2nd, of the *mucous membranes,* including the squamous, columnar, and that curious modification of the latter, the ciliated variety. These latter by the constant motion of minute hair-line appendages create a current, by which the objects in contact are propelled in definite directions, a notable example of these being the lining of the respiratory tract, where expulsion of the accumulating mucous is necessary. In the lower forms of life these minute cilia form an efficient means of obtaining nourishment, by creating currents by which food is drawn to the animal. 3rd, of the *serous membranes* where the cells form large flat plates, usually distributed in a single layer, while the coverings of the mucous membranes consist of several. As modifications of the cells of mucous membranes those constituting glands, the so-called glandular epithelium, present themselves.

Thirdly, *cells of the connective-substances* whose forms vary from oval to beautifully stellate, according to age and development: of these beautiful examples are exhibited as found in embryonal tissues and in the cornea.

Fourthly, the import group of *cells of the muscular system:* in the voluntary muscle and in tendon are striking examples of departure by development from the original form of the cells: in the involuntary muscle cells, here taken from the mesentery of the newt, is a beautiful illustration of the spindle or lanceolate form.

Fifthly, *cells of the nervous system.* We here have some of the splendid branched nerve-cells formed in the spinal cord, each in communication with nerves, and with each other, and capable of originating within themselves nervous force; next represented are the cells taking part in the formation of the cerebral mass, including those of the cerebrum, cerebellum, and pons varolii: in addition to these is a slide of typical ganglion cells of the sympathetic nervous system.

As interesting modifications, the cells forming the terminal organs of special sense present themselves, where func-

tion is again seen to deeply impress the cells: we have here those of touch and taste, smell and sight, as represented in the Pacinian corpuscle, taste-buds, Schneiderian membrane, and the retina.

In this hasty, and by no means complete, consideration of the cell, we have seen that the typical cell is composed of cell-wall, cell-contents, and nucleus, and sometimes nucleous; that in many instances one or more of these parts may be wanting, and yet the term "cell" may be applied: that usually the nucleus, sometimes, however, the entire cell, is the seat of vital manifestations—that the nucleus is composed of the living-matter or bioplasm; that while in the lower forms of life the cell may constitute the individual, the higher we ascend the scale the greater the specialization of function and a corresponding modification of those cells to which now are assigned special duties; and, finally, that, while at one stage in the existence of the most highly developed organization all the component cells were morphologically similar and undistinguishable, yet in the course of growth and development into the capability of performing their assigned roles, their forms undergo great and permanent alterations.—*Western Med. Reporter.*

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## *Alabama State Dental Association.*

The Fourth Annual Meeting of the Alabama State Dental Association, will be held in Montgomery, Alabama, on the second Tuesday in April, 1883

All are cordially invited, and an interesting programme may be anticipated.

E. WAGNER, D. D. S., *Secretary.*

P. O. Box 138. MONTGOMERY, ALABAMA.

# EDITORIAL, ETC.

*Vaccine Virus.*—How it is obtained by the Innoculation of heifers, and the preparation of the lymph for use:

In view of the prevalence of small pox throughout the country and the grossly exaggerated reports concerning the extent of the diseases in Baltimore, where it is now confined to limited areas in the Southern and Eastern portions of the city, and even there rapidly decreasing, the following description will prove instructive:

Taking the Washington City national vaccine establishment for an example: At present the stock on hand numbers sixty heifers, ranging from six to twelve months of age. These heifers are mostly thoroughbred, with fine skins and soft hair. Dr. Walsh never vaccinates a scrub calf if he can help it. After being brought to the farm they are carefully stalled and fed for a week or ten days before vaccination. From the farm, which is some distance from Washington, they are brought to the establishment in lots ranging in number according to the demand for virus, and kept under the personal supervision of Dr. Walsh until the process of vaccination and collection of the virus is complete.

The process is as follows: The heifer is carefully strapped on her back on a padded trough, under and adjacent parts of the abdomen are smoothly shaved. The scarifications for putting in the virus vary in number according to the size of the heifer, generally about a dozen points of vaccination, each being three-quarters of an in inch in diameter. This vaccination is done with seed virus propagated from heifer to heifer, and is of the Beaugency stock. The virus originally comes from a disease

peculiar to cows known as cow-pox. After the vaccinaiion an apron is placed over the vaccinated surface as a protection against dirt. The effect on the calf is hardly noticeable. Food is taken as usual, and up to the sixth day there is no striking change in the vaccinated places. By that time the vesicles are filled, and the virus is taken from the sixth to the seventh day. Pure vaccine lymph is colorless; a red tint indicates the presence of blood. When a quill or point presents a red or brown tint it is due to the presence of blood; a yellow tint indicates the presence of pus, each of which is a foreign and possibly dangerous materisl. Nothing but quill slips are used by this establishment.

The quills are boiled to rid them of any grease, then filed, split and pointed. They are charged with the virus by dipping the convex surface of the pointed end in the lymph as it exudes from the vesicle. In order to do this the calf is strapped on its back on the trough on which it was vaccinated. Here is where honesty and dishonesty may be shown in this business. A vesicle yields but a certain amount of pure lymph. After it has been removed on the surface of these quills, or points, serum will commence to well up from the bottom of the vesicle. This serum is feebly charged with virus and should not be furnished as a genuine article. The careful collector of this virus stands bent over the heifer for about four hours, dipping the quills in the exuding virus. The heifers are held in a comfortable position by straps, loose enough to allow them the privilege of kicking a little. After four hours the animals begin te experience some discomfort from their unnatural position, and are put on their feet again for a time at least.

After being charged the quills are carefully dried in a cool place before being packed. They are wrapped in packages of ten, first with tissue paper, then rubber tissue, inclosed in a tightly-corked vial, which is placed in a metal mailing package for transportation. The number of quills taken from a heifer is a lottery, sometimes not as much virus being produced as was put on in vaccinating. In exceptional cases 2,500 points have been taken from a heifer. A heifer can never be used more than once for the purpose, her constitution being changed by the process. The vaccination not only does not hurt the heifer,

but is a positive benefit, The animal, after the process, improves more rapidly, fills out and develops. It has been clearly shown in northern herds that it acts as a preventive of contagious diseases. In herds attacked with pleuro-pneumonia and other contagious diseases, those animals that had been vaccinated escaped. Dr. Walsh believes that any disrepute into which bovine virus may have fallen is the result of dishonesty practiced in its preparation. The pure lymph in his opinion is as active to-day as when the Beaugency stock was first procured. Dr. Walsh frequently receives orders for the vaccine crusts off the heifers, but he discourages such use of them, as he does not think them reliable.

Dr. F. M. Welles, one of the proprietors of the New England vaccine establishment, who is in the city says that their business at Chelsea, Mass, has been in existence 12 years. Last year 1,976,000 points charged with virus were sent to various parts of this country, South America, West Indies, China, &c. The doctor said that none but the best stock is used, animals being selected which have thin skin and short hair. They are placed in stables and fed only on hay, grain being considered too heating. Well-grown cattle, fat enough for beef, are considered the best. The bone or ivory points are first dipped in the lymph from one animal, allowed to dry, and then dipped in that coming from another animal. Dr. Welles says it requires double the amount of lymph to charge an ivory point that will charge a quill. The virus, before being used is put to the highest test as to purity, and care is taken that no blood gets upon the points, for fear that blood-poisoning might be produced.

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*Dr. Marshall H. Webb.*—A bibliographical notice of Dr Webb. prepared by Dr. Longnecker, his former pupil and friend appears in the February number of the *Dental Cosmos*, but the occasion demands something more than a passing tribute to Dr. Webb's disinterested and valuable services to the profession. He gave time and effort without stint to teach all who chose to learn whatever improved methods he had devised, and it is safe to say that all over the country better dentistry is being done to day in many offices as a result of Dr. Webb's clinics and

teaching. A sad side of the case is that, with the feeling that life was before him, years of labor, he gave more of his life and strength for the general good than he could afford to; more doubtless than he would have done had he foreseen the early termination of his career. He has left a widow and three children unprovided for. His record is finished and is before the profession. Already, without solicitation, a score of operators have expressed their sense of obligation and their sympathy by generous subscriptions to a testimonial fund. The editor of the *Dental Cosmos* has been solicited to act as treasurer, and will gladly receive and acknowledge any subscriptions which may be sent as a token of appreciation of the unselfish work of Dr. Webb and of sympathy with his bereaved family.

Dr. J. W. White, the editor of the *Dental Cosmos*, has requested the editor of this JOURNAL to bring the matter before the profession in this section, and receive and forward subscriptions, which he will gladly do, and appeals to the profession of Baltimore city and State of Maryland to respond to this meritorious action. Any subscriptions can be forwarded directly to Dr. J. W. White, S. S. White Dental Manufacturing Co. Cor. Chestnut and 12th Streets, Philadelphia, or to the editor of this JOURNAL. through Messrs. Snowden & Cowman, Publishers. 86 West Fayette Street, Baltimore.

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*Valuable Contributions*:—The Museum of the Dental Department of the University of Maryland has recently been presented with several entire dentures of "Continuous Germ Work" by Dr. John Allen, of New York City. These valuable specimens are gotten up in the beautiful and attractive manner for which Dr. Allens' work has so long been noted, and are perfect specimens of what may be accomplished in a style of dental mechanism which has always commanded the admiration of dental practitioners and patients. Demonstration and work by students in 'Continuous Germ' have been conducted in the Laboratory of the Dental Department of the University of Maryland during the present session, and some excellent specimens of work have been the result.

Dr. Samuel A. White, of Savannah, Georgia, has presented to the same Dental Museum beautiful casts in plaster of a rare form

of irregularity, in which the molars alone articulate, the teeth anterior to them standing apart, so that the space between the incisors of both jaws is over one inch in extent. Dr. White has also presented a number of specimens of malformed teeth which are both interesting and unique.

Dr. W. T. Pool, of Columbus, Georgia, has also presented to this Museum with several hundred specimens of abnormally shaped teeth.

So many and valuable are the specimens already collected that the Museum of the Dental Department of the University of Maryland will already compare favorably with those of other institutions, and will soon excell many of them in the nature and value of its specimens.

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*Diagram of an Incisor Tooth.*—We are in receipt of this beautiful illustration of the minute structure of an Upper Central Incisor which was published under the direct supervision of Professor Frank Abbott, M. D., and by special request of the Dental Society of the State of New York. The object was to give to the dental profession a correct idea of the minute anatomy of a tooth. If not absolutely perfect microscopically, it approximates so closely to nature that it conveys to the mind at once an intelligent understanding of the structure and relations of the organ.

The diagram represents a longitudinal section of the tooth. It is 13½ by 9½ inches in size, and is printed in six colors. It shows, clearly, Naemyth's membrane, the enamel, dentine, cementum, and pulp, with periosteum and socket of alveolar process, covered by the gum; the blood-vessels and nerves of the pulp; the odontoblasts surrounding the pulp; the direct connection of the non-medulated nerve-fibres with the odontoblasts, and the passing of those fibres between these bodies, into the dentinal canaliculi, and the distribution of living matter in almost every direction throughout the dentine, finally reaching the interzonal layer, (interglobular space), whence it enters the enamel, to which it is more minutely but as clearly distributed.

The price is $1.00. The S. S. White Dental Manufacturing Co. Philadelphia. One of these Diagrams has also been pre-

sented to the Dental Department of the University of Maryland.

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*A New Discovery.*—Dr. G. Bœck says: If potatoes are peeled and treated with eight parts sulphuric acid and one hundred parts of water, and then dried and pressed, a mass is obtained very like celluloid, and which can be used instead of meerchaum or ivory. It is not stated whether the invention is protected by a patent or not.

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*The Annual Commencement of the Dental Department of the University of Maryland.* will be held at the Academy of Music, Baltimore Wednesday, March 15th, 1883. The Dental Profession is invited to attend.

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# OBITUARY.

*William Fiero Edington. M. D., D. D. S*, died at his residence in Geneva, New York, on Saturday, January 27th 1883. Dr. Edington had been ill for more than two years, but not seriously until some two weeks before his death, his affection being Brights' disease of the kidneys, complicated with organic disease of the heart.

Dr. Edington was born in the present town of Seneca, as were his parents. He was born in February 17, 1826, being nearly 57 years of age at the time of his death. He studied dentistry, and graduated at the Baltimore College of Dental Surgery, of the class of 1856, immediately after practicing at Dundee, N. Y. In 1854 he removed to Geneva, continuing his practice. He then studied medicine and received his degree of M. D. degree of M. D. from, the Geneva Medical College.

Dr. Edington was an honorable and spirited citizen, and occupied an exalted reputation as a dental practitioner. He was a warm friend of the Dental Department of the University of Maryland, being a member of the corps of Clinical Instructors of that institution at the time of his death, and always manifested a great interest in dental education.

# MONTHLY SUMMARY.

*Professional Courtesy.*—Will the time ever come when the spirit of jealously and personal feeling shall depart from all professions and every man shall hail every other as brother and friend? What a spectacle is presented to the world in almost every town and city where professional men most do congregate, of that petty strife and bickering spirit that results in a mutual loss of respect and frequently develops into actual hatred.

It is found as often in the dental profession as in any other. Who has known two or three of the leading dentists of a town or city to be on friendly terms? Instead, we all know the common experience, of being forced to listen to slurring and derogatory remarks of one or more of the profession, sometimes of all as a whole, the manifestation of a churlish, uncharitable spirit that savors of anything but "Professional courtesy" or a conformity to the spirit of the "Code of Ethics." Yet these same old stagers who are frequently not on speaking terms with each other, are apt to be most chary of extending a cordial welcome, to the beginner in practice, and watch with jealous eye his every move, and are quick to condemn anything they may consider "unprofessional."

Now this is not as it should be, and while it is an unpleasant truth, yet it should receive consideration, and sober thought from every dentist who loves his profession and is jealous (in the right spirit) of its honor. Let us strive to lay aside our personal feeling more and be governed by that broad spirit of honorable dealing and true courtesy that refuses to speak ill of any man, and especially of a professional brother, to not only do that, but make an effort to be friendly, and extend the fraternal hand to every one. To whom shall the beginner in practice

look for encouragement if not to the older members of the profession? Is it apt to increase his respect for the profession at large or for its leaders, when he sees manifested that unprofessional feeling of jealousy so often exhibited? I fear not.

We all can call to mind a few dentists who seem to feel that every other dentist is a natural enemy, to be treated accordingly. However, I am glad to know that their number is not legion. But I appeal for the honor of our calling when I say, let us cultivate more and more the virtues of forbearance, mutual respect and that unity of effort that will place us, as a profession, on somewhat higher ground in respect.—*Dental Headlight.*

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*Malformation of the Jaws of a Horse.*—Normally the male horse has forty and the female thirty-six teeth. In each jaw there are six molar teeth upon each side. The specimen was interesting for the fact that there were *seven* teeth in each molar arch. On the left side of the head, the molars had, instead of meeting squarely, shut over each other, so that the lower ones, had been bevelled off upon the outside, and the upper ones upon the inside. On the right side of the head the molars presented the normal appearance, except with reference to number. Some eight or ten years ago, the animal was under his observation, and at that time had difficulty in masticating. Subsequently symptoms of apparent glanders developed, and finally the food passed out through the nostrils. At the post-mortem there was found, besides the deformity of the jaws, disease of the palate bone, that accounted for the fetid discharge and apparent glanders. There was also a marked change in the curve of the incisor arch, so much so, that the lower front teeth were nearly horizonta.l—*Dr. Liautard in Med. Record.*

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*To Disguise the Odor of Iodiform.*—We have had many queries as to how this may best be accomplished; we therefore give every reliable report on the subject. The following is from the *New York Medical Journal and Obstetrical Review:* "Having tried nearly all the devices that have been suggested for mitigating or disguising the odor of iodiform, and found them all of little or no avail, we have lately come nearer to the

object by using oil of eucalyptus according to the following formula :

℞. Pulv. iodiform, ℥ss
Eucalypt., ℥ss
Vaselin, ℥iv.
M. ft. ungent.

This ointment is not without odor, but the odor is not that of iodiform."—*Med. and Surg. Reporter.*

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*Decolorization of Hair Associated with Neuralgia.*—The *Medical Times and Gazette* says that M. Raymond relates the case of a lady of 38, who was suffering from neuralgia of the scalp. After suffering several days the pain became much worse one evening, and morphia was powerless to relieve it. At two o'clock the next morning the pain was at its worst. At this moment the hair had its normal color ; at seven o'clock the same morning it was found that her hair was almost completely decolorized." It is remarkable that at first the greater part of the patient's hair became red, turning to white a few days later ; and later still, falling off in considerable proportion. The case affords an absolute contradiction to Kaposi's theoretical view that blanching of the hair can never take place very rapidly, but *must* require several weeks for its completion.

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*Excision of the Tongue.*—Mr. Croly, of Dublin, performs the following operation for cancer of the tougue, even when the disease is situated in the anterior portion of the organ. He first ligatures each lingual artery close to the hyoid bone, through a curved incision, reaching from the symphysis down to the hyoid bone, and up and back to the angle of the jaw. Through these incisions he withdraws the tongue, as in Regnoli's operation, and removes the requisite amount of it by the benzoline cautery. Lastly, he divides the gustatory nerve where it lies along the inner border of the jawbone.—*Med. and Surg. Reporter.*

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# DENTAL SCIENCE.

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## ARTICLE I.

### *Attachment of Artificial Crowns to Natural Roots.*

BY H. W. F. BUTTNER, D. D. S., NEW YORK, N. Y.

[Read before the New York Odontological Society, October 17, 1882.]

Although this subject had been extensively discussed, yet many will agree with me that the problem had not been satisfactorily solved. The great value of pivoting operations has long been recognized, and has been one of the most important questions for the last thirty years. In looking over the dental journals we find a great many varieties of attachments for artificial crowns upon natural roots have been described. In order to get a clear idea of the importance of this problem, and to give due credit to those who have contributed to the general knowledge, I will, before entering upon the description of my method, give a brief sketch of a variety of processes, as published in the journals. Although there is a distinctive difference in these processes, they may be divided into two general classes.

The first, and doubtless the oldest method, is that which depends upon a central pivot of wood or metal, to hold the artificial crown in position.

The second class consists of methods in which, besides a

central pivot a ring is fitted around the root, to increase durability and prevent fracture.

HISTORY.

The first who introduced the latter method to the profession was Dr. W. H. Dwinelle, who, in an elaborate article, published his invention in the AMERICAN JOURNAL OF DENTAL SCIENCE, vol. v., page 278, April, 1855. I quote as follows: "Another method is to line a tooth, then solder a band of gold around it, so that it will correspond to the presenting outline of the root to be covered. * * * A gentleman of my acquaintance has, for several months past, worn an artificial cusp and crown of this general character upon a root which retains a living and healthy nerve. By accident the natural crown was broken off, but in such a manner as to leave a large portion of the central part of it covering the nerve, which protruded so far that, by cutting a groove around its base, it somewhat resembled an inverted cone; gold was packed around this until it nearly reached the outline of the root, when the prepared cusp and crown, which had been previously fitted, was secured to its place. The gold-bound cavity was then filled with gold as described."

This article is illustrated by cuts, showing the several steps to be observed in the setting of these crowns.

In an article by Dr. W. N. Morrison, of St. Louis, in the *Missouri Dental Journal*, 1869, page 184, he gives a description of a new method of setting gold crowns, of which the following is an abstract. An impression of the remaining portion of the root is obtained, a metallic die representing the form of the crown constructed; over this a thin piece of gold is swaged, accurately fitted to the root and extending below the free margin of the gum, and after soldering a bar across the inside of this crown it is fastened to the root with cement.

Dr. Beers, of California, patented a method in 1873, which is described as follows: "Fit a stout gold band around the

neck of a tooth; then strike up in a piece of lead a gold crown, the size required, and run gold solder into it, to make it strong; adjust and solder it on the gold band that fits the root. Screws with T-heads are then secured in the root-canal and the crown pressed in position with hard cement."

In vol. xxii. of the *Dental Cosmos*, page 463, 1880, Dr. Talbot, of Chicago, describes an inprovement upon the Beers method by fitting a plate inside of the ring, penetrating this opposite the root canal and screwing it on the root, placing a layer of gutta-percha between root and cup. The gold crown is fitted either over or inside of this cup and also fastened with gutta-percha.

In the American Journal of Dental Science, vol. iii., page 497, 1853, Dr. A. T. Willard describes a method of pivoting. The root is cut level and below the gum, and prepared with an instrument which he calls a counter-drill. A smaller sized one is used next to cut into the inside of the root about one-sixteenth of an inch deep. The crown is prepared to fit the counter-hole in the root accurately, and has a wood pivot which is fastened in the root with mastic.

In the American Journal of Dental Science, vol. vi., page 24, 1856, Dr. John Coghlan, of Ireland, describes a capillary tube used in pivoting teeth. It was formerly applied instead of a solid gold pivot to facilitate the escape of gases and fluids from the root.

A method of pivoting teeth by Dr. T. J. Thomas is as follows: A square pivot of platinum-and-gold alloy is made by soldering two narrow pieces together at one end. The pivot is finished smooth and made accurately square. Thin platinum is bent around it, jointed and soldered. The root is prepared with under-cuts and drilled out largely in excess of the size of the pivot used. The square cylinder is fastened in the root with gold or amalgam, which, when hard, is filed smooth; a plate of soft gold is fitted to the margin of the root, and the pivot, after being placed in position is soldered to it. A plate-tooth is backed and fitted to the

plate; both parts invested and soldered. The free ends of the pivot are bent apart before inserting.

In the *Dental Cosmos*, vol. ii., page 417, 1861, Dr. J. D. White describes his method: The root is enlarged for the reception of the pivot. A piece of hickory is perforated with a drill, and a gold wire forced into it; the wood condensed with a burnisher to fit the root. A natural or a porcelain crown is fitted to the root; the proper position obtained with a temporary pivot. The crown and pivot are inserted by setting a peg of wood against the cutting-edge and driving it home with a mallet without too much force. Plate-teeth are used in the following manner: "Solder a strong plate to the tooth as a backing, and to this a round wire for a pivot; drill a piece of wood to fit the gold pivot; then dress this down so as to fit the hole in the root; place it in the root, keeping it dry; dress it even with the root, and place your tooth in, and the operation is complete." In cases where the root is much decayed, it is drilled out a gold cylinder is screwed into it, and the groove between the margin of the root and the tube plugged with gold. The crown is subsequently set into this with a solid gold wire.

In vol. iii., page 614, 1862, *Dental Cosmos*, Dr. S. Richardson describes a method of using vulcanized rubber in pivoting teeth. An ordinary pivot crown is fitted to the root, leaving a space posteriorly between crown and root; the crown is attached to it with a temporary wood pivot, which is withdrawn, and soft wax interposed between the root and crown; this is pressed into the root to obtain an impression; the crown and pivot are again withdrawn; invested in plaster in such a manner as to be able to withdraw the wood pivot and remove the wax from the investment; soft rubber is now packed into the space, and a gold wire inserted to strengthen the pivot. It is then inclosed in a flask and vulcanized. Before inserting, gold foil is placed between the root and crown to make the joint perfect. By another method spring gold wire is incased in

tin foil; a layer of rubber wrapped around it and vulcanized. The root must be prepared to receive the above pivot with its lining, which is forced into it. The fitting of the crown is the same as in the former method, except that no temporary pivot is used. The crown is fastened to the wire in the root with hard wax. It is withdrawn and manipulated the same as described before, except that the gold pivot is permanent, not being incased in rubber in the investment. To secure this tooth in the root the pivot is either split or flexed upon itself and then forced into the root. A plate-tooth may also be used with the above method. The root is prepared in the same manner as before; a plate-tooth backed with gold, waxed to the gold pivot, and carefully withdrawn; invested and soldered; then re-applied; soft wax pressed posteriorly upon the base of the root; this then removed and imbedded in plaster; rubber is packed into the space after removal of the wax, and the operation completed as in the former method.

In vol. v., page 218, 1863, *Dental Cosmos*, Dr. J. H. McQuillen describes the use of osteo-dentine in the setting of pivot teeth: In cases where the walls of the root are too thin to support a pivot, the root is cleansed from decay; filled nearly even to the top with osteo-dentine; a pivot tooth with wood pivot is pressed into the root. By this process the parts are firmly united.

In vol. vii., page 301, 1865, *Dental Cosmos*, Dr. C. E. Latimer, describes a method of pivoting. The nerve-canal of the root is enlarged and compactly filled with gold; a hole is drilled into the center, a little smaller in diameter than the pivot intended to be used; with a screw-tap the hole is prepared for the pivot, which consists of silver wire with a screw cut upon it; this is screwed into the root, projecting a little from the surface, around this and over the base of the root Wood's alloy is carefully worked, a rubber tooth is fitted to the space, the metal moulded around the pins and finished to imitate the shape of the natural crown.

In vol. vii., page 361, 1866, *Dental Cosmos*, Dr. I. J. Wetherbee gives the following method of applying a common pivot-tooth: A screw is cut upon a gold pivot about one-third its length and firmly inserted in compressed hickory; the end which enters the crown is provided with a dovetailed slot, which is filled with wood so as to retain the crown in position. The pivot is then carried to its position in the root, and the space between the pivot and cavity filled with gold. A cylinder of wood is inserted in the crown, placed in position and forced in the root. By another method the porcelain tooth is made with a groove in the center of its posterior surface, with two platinum pins on either side, for the purpose of receiving a gold backing and cylinder, to be soldered and finished to represent the ordinary form of pivot-teeth. The cylinder may be round or square. The insertion of the pivot is the same as in the former process.

In vol. x., page 530, 1868, *Dental Cosmos*, Dr. M. L. Battle describes his method of mounting pivot-teeth. The root is prepared with under-cuts; a gold pivot fastened into it with gold; the tooth ground to fit the root, and left about one-twentieth of an inch shorter than the tooth next to it. Amalgam is packed around the pivot and over the surface of a root. The crown is then forced on until it has the proper length. The same may be done with a wood pivot.

In vol. xi., page 1, 1869, *Dental Cosmos*, Dr. E. Blake gives his method. A thin gold tube with a longitudinal slit is forced into the root, which has been prepared for this purpose. An ordinary pivot-tooth is used by adjusting a gold or platinum pivot in the pivot-hole and flowing in solder. A way which he considers better is to cap the end of the root with thin gold plate to be retained in place by a pivot attached to it. A plain plate-tooth is backed and soldered to this plate. Another plan is the adaption of a hollow screw to the hole in the root; this is screwed into the root and the crown is attached as described before. When a root does not stand in its proper position, prepare the root

with a tube: fit a pivot of gold; cover the base of the root as before, only extending the gold over the gum to the place where the new tooth is required; and mount a plate-tooth on this base.

In vol. xiv., page 583, 1872, *Dental Cosmos*, Dr. M. H. Webb describes and illustrates a method of piveting. A heavy narrrow gold backing is attached to the crown, extending into the root, which is filled in with gold, extending over the margin of the root around a dovetail backing and built up to complete the contour on the plated portion.

In vol. xv., page 110, 1873, *Dental Cosmos*, Dr. Manuel Trujillo describes his plan of pivoting. Take an impression of the root; make die and counter-die; swage a platinum plate and trim it according to the shape of the root. Perforate the plate opposite the root-canal; make a platinum pivot and fasten through it by solder; fit a plain plate-tooth thereon and fill the palatal portion with solder. The root-canals is provided with under-cuts and the tooth fastened with bone filling.

It vol. xv., page 155, 1873, *Dental Cosmos*, Dr. E. L. Hunter describes this method: A pin of platinum alloy, with a thread cut on one end and a cleft on the other is screwed into the root, the cleft being intended to occupy the hole in the crown. Several of Mack's screws are attached to the base of the root; gold is filled around these and over the margin of the root, and the tooth is fitted to this surface and fastened by driving it over the cleft end of the pivot.

In vol. xv., page 289, 1873, *Dental Cosmos*, Dr. M. H. Webb describes gold crowns with porcelain faces. A plate-tooth with straight pins is backed with gold, the latter bent to form a cannula. A platinum-gold pivot is fitted to this, and left long enough to extend into the root. The pivot is held in the root by packing with gold, and the gold built over the margin of the root and palatal portion of the crown as well as the lateral grooves of the cannula and dovetailed cuts in the posterior surface of the porcelain face.

In vol. xv., page 503, 1873, *Dental Cosmos*, Dr. G. P. Carman describes the following plan. An ordinary pivot tooth with a hole drilled clear through it is fitted to the root; a gold pivot is fastened in the root and split at the opposite end; the crown is set in position and the split end of the pivot filled with gold, thus holding the crown in place.

In vol. xv., page 657, 1873, *Dental Cosmos*, Dr. B. O. Doyle, gives the following method. A pivot-crown is used in this process; a cylinder of heavy gold is prepared and forced into the hole, and a metallic pivot is fastened therein with shellac. The cavity in the root is filled with powdered shellac, and the tooth and pivot are then warmed and pressed into position.

In vol. xv., page 666, 1873, *Dental Cosmos*, Dr. T. S. Phillips, of Buffalo, describes his method of pivoting with gold pivots. A gold tube with screw-cuts upon its outer side is fastened in the root; under-cuts are made for the anchorage of gold, which is built around the tube and over the margin of the root. A gold plate is fitted to this surface; A pivot smaller than the tube is soldered to this and a plate-tooth backed and soldered to the plate. Another tube is now inserted into the former, the pivot fitting this tube accurately, and the tooth is forced in position.

In vol. xvi., page 358, 1874, *Dental Cosmos*, Dr. E. W. Foster, of Boston, describes and illustrates his method. Porcelain crowns similar to the ordinary wood-pivot crown are used for this process; the hole runs through the crown and is enlarged at the posterior part, forming an open cavity. These crowns are, after being fitted to the root, screwed thereon with steel screws. Gold foil is used for a packing between the root and crown. Where the end of the root is extensively decayed, it is filled with gold. This process can be applied as well on the front as on the back teeth.

In vol. xvii., page 604, 1875, *Dental Cosmos*, Dr. T. F. Chupein, of South Carolina, communicates the following plan. The root-canal is enlarged, having a reserved cone-

shaped under-cut at the lower end. A gold cylinder provided with a screw at the upper end is screwed into the root and filled around with gold. A gold plate is fitted to cover the margin of the root air-tight. The pivot is of the split type; it penetrates the plate and is soldered to it. A plain plate-tooth is backed and soldered to the plate. Before inserting, the slit ends of the pivot are separated, and thus the crown is held in position by spring-power.

In vol. xviii., page 53, 1876, *Dental Cosmos*, Dr. Dwight M. Clapp, of Boston gives his plan of pivoting. The root-canal is enlarged and provided with under-cuts at the lower end. The hole is filled up, solid with gold, which extends over the face of the root. A hole is drilled in the center of the gold filling, for the reception of the pivot. The crown is fitted to the gold surface and attached with a wood pivot.

In vol. xviii., page 110, 1876, *Dental Cosmos*, Dr. J. R. Wilcox, of Michigan, proposes the following. The root is enlarged, with under-cuts; filled with amalgam, which is extended over the face of the root; an ordinary wood-pivot tooth is attached by a hickory pivot.

In vol. xix., page 481, 1877, *Dental Cosmos*, Dr. W. G. A. Bonwill's method is described and illustrated. The root is prepared with under-cuts and enlarged greatly in excess of the size of the pivot that is to occupy it; and to prevent exposure of dentine, the margin is counter-sunk. The metal pivot used has an enlargement at one end and a screw-thread at the other. The enlarged part of the pin is retained in the root by amalgam, after the setting of which a full porcelain crown, with a hole running through and counter sunk at both ends is fitted; the counter-sunk portion of the crown is filled with amalgam, forced into position and screwed down with a nut. Another mode is to set a three-cornered platinum pin in the root and press the crown over it, using amalgam as before. No screws or nuts are used in this latter process.

In vol. xxi., page 232, 1879, *Dental Cosmos*, Dr. H. K. Leech describes and illustrates his plan. The root is drilled

out and enlarged toward the apex. A gold tube corresponding with the drill-hole is prepared ; a plate is fitted to the face of the root, and the tube run through it and soldered. A plate-tooth is backed and fitted to the plate. The tube is now split in two or more places ; gutta-percha is laid between the root and the tooth ; the latter is warmed and pressed into position. The gold tube is filled with gold —the expansion of the split end of the tube wedging it firmly into the cavity.

In vol. xxi., page 289, 1879, *Dental Cosmos*, Dr. G. W. Weld gives a method which he terms "engrafting." The root is extracted and cut squarely off at the neck. A porcelain crown with a tapering screw baked in it is screwed into the root. Root with crown is replanted.

In vol. xxi., page 322, 1879, *Dental Cosmos*, Dr. William Jarvie, Jr., tells how to attach crowns to bicuspid and molar roots. Obtain a model, drill holes in it to correspond to the nerve-canals in the roots; fit into these iridium wires; make a cap for the end of the root ; solder the wires to this ; back a plate-tooth ; place it in position on the model, then invest and solder. The attachment is with gutta-percha.

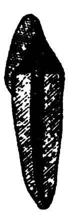
In vol. xxiv., page 81, 1882, *Dental Cosmos*, Dr. Henry Weston describes his method. The pulp-canal is prepared with under-cuts and sufficiently enlarged to allow space for packing of gold, amalgam, or cement about the pin ; the latter is of platinum and iridium, spear-shaped, and notched to give firmness to its anchorage. A specially prepared crown is used for this process, concave at its lingual or palatal portion. After fitting the crown to the root and ascertaining the position of the pin, the latter is soldered to the crown. It is fastened to the root by gold, amalgam, or cement, which is packed around the pin and built over the palatal or lingual portion to the full contour of a natural tooth.

I have for several years taken a particular interest in setting artificial crowns on natural roots. It always appeared

to me that it would be an inestimable benefit to the profession to possess a method of attaching artificial crowns which would combine strength, firmness, and durability, and preserve the exposed end of the root from further decay. Great efforts, as the literature shows, have of late years been made to solve this problem, yet you will agree with me that the percentage of really successful operations by the various methods heretofore enumerated is too small to be pronounced satisfactory. There is no reason why the attachment of an artificial crown to a root cannot be made as perfect as a gold filling in an accessible cavity; but the accomplishment of this with cement or other plastic filling-material, is extremely doubtful. It has been a settled ques-in my mind, for a long time, that nothing could lead to success but a method which was in accordance with true mechanical principles.

IMPROVED METHOD OF ATTACHMENT OF CROWNS.

FIG. 1.



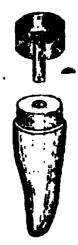
In my method of setting artificial crowns, I claim simplicity of construction, firmness, durability, and arrest of decay of the root (FIG.) From the follow-lowing description of my method it would seem that a failure would be almost impossible. To protect the end of the root from decay and to obtain a strong hold for an artificial porcelain crown, a gold band, properly applied, must be of the greatest benefit. I am aware of the fact that gold bands have been applied, but I am convinced that their adaptation after any of the old methods is defective. What I claim in my method is the preparation of the neck of the root by a set of instruments especially constructed for that purpose. These instruments enable the operator to obtain as nearly perfect adaptation between the gold band and the root of the tooth as can possibly be made. With reference to the upper centrals, laterals, and canines, as well as the corresponding lower teeth and bicuspids, there can be nothing more favorable than the application of this method. It is true that this process cannot be applied with the same

advantage to the upper bicuspids or any of the molars, but I hope in time, if I am in any way supported by the profession, to solve that problem. I believe I will succeed in constructing a set of instruments which will prepare a root, the pulp of which is alive and may if healthy be readily kept so. But as this set of instruments is not quite completed, I will abstain from its description, and only allude to the setting of crowns which require the devitilization of the pulp, unless this organ has previously died. With these instruments a circular shoulder is turned on the neck of the root.

The alteration of the neck of the root, from an irregular cone to a cylindrical form, enables us to adapt a corresponding ring or cap. Such a cap, when fitting around as well as upon the end of the root prepared by these instuments, forms an air-tight joint and consequently protects it from decay, at the same time giving the porcelain crown, when attached, a firmness which heretofore has never been obtained. The set of instruments by which the neck of the root is prepared consists of drills, reamers, and trephines. The drills (FIG. 2) are used to enlarge the root-canal for the guidance of the reamer or facing instrument and trephine. The reamers (FIG. 3) cut the surface of the root down as far as necessary. They produce a perfectly level surface and have a center-pin, which corresponds with the hole made by the drill in the center of the root, and acts as a guide. The trephine (FIG. 4) has also a center-pin, and is used to make the root cylindrical below the free margin of the gum. A set of these instruments includes different sizes of drills, with reamers and trephines corresponding in size adapted to various diameters of roots.

FIG. 2. FIG. 3. FIG. 4.


FIG. 5.



The ferrules or caps (Fig. 5) to fit roots which have been prepared by the above instruments are of gold, made by steel dies. They correspond exactly with the trephine in diameter and depth with allowance for sufficient expansion of the gold when forced on to the shoulder of the root, whereby a most perfect joint between cap and root is obtained. They have a stout central pivot which fits the hole in the root and gives increased strength and firmness.

Fig. 6.

The pulp-canal is enlarged with one of the drills selected with reference to the size of the root. A reamer corresponding in size is used with the dental engine to cut the root down to a perfect level. The trephine is applied in the same manner to give a cylindrical form to it, thus completing the shoulder (Fig. 6).

A steel wire corresponding in diameter with the drill which has been employed is now introduced into the root, projecting out about half an inch. It serves to indicate the exact direction of the root-canal. An impression-cup is selected with an opening opposite the missing tooth to take an impression of the root and adjoining parts. The object of the opening is to give free transmission to the wire in the root-canal. The wire protruding through the cup and impression-material is drawn out carefully before the removal of the impression-cup, which is then removed and the wire placed in its proper position in the impression. A set of brass root-models (Fig 7) corresponding in size with the instruments accompany them; one of these bearing the same number as the instrument with which the root has been prepared, is now placed on the wire in the impression, and serves to represent the prepared end of the root on the model. The impression is now ready to be filled with plaster. After the cast is obtained, we find the root-model imbedded in the plaster and the wire in its center-hole. The wire is now removed and the plaster cut from

FIG. 7.

FIG. 8.

around the root-model to the depth of the gold cap, which is ready to be placed upon it. A plain porcelain tooth (FIG. 8), as used in plate-work, is ground hollow on the inner surface to cover the outer front wall of the cap, thus hiding the gold Thin platinum backing is now adapted to the tooth, which is then ready to be placed in position on the model over the gold cap, and fastened thereon with hard wax. The united parts are removed carefully from the model, invested in sand and plaster and soldered. After polishing, the cap is ready to be forced upon the root by placing a piece of wood on the cutting-edge of the tooth and driving it home with a mallet.—*Dental Cosmos.*

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## ARTICLE II.

### *Relaxation for Dentists.*

Of all the plain, though sometimes unpalatable, truths which were told Americans by that distinguished scientist, Herbert Spencer, during his late visit to this country, there were none which should sink deeper into our hearts than the charge that we are too utterly devoted to business, and do not take sufficient time for relaxation. The average American has a highly-wrought, nervous organization, partially due to a peculiar climate, but constantly exaggerated by the incessant whirl and bustle of excitement in which we delight, and by the intense and feverish application to business so characteristic of us as a people. Even the very few pleasures which we allow ourselves are tainted by this over-exertion, and our hours of ease are made laborious by a constant state of unrest. If the typical American travels, though it be solely for recreation and pleasure, it must be by express train. If he attend the theatre or opera, or goes to a concert, he does not arrive until after the commencement, while he leaves just before the close, and all the

intervals are filled up with his newspaper or note-book. There is no quiet, leisurely repose, no shaking off of worldly cares, no forgetting the shop, no utter abandonment to entire leisure. Because of this, we are too often the prey of certain ailments to which the average European is almost a stranger. Whatever illness attacks the American is almost sure to be complicated with some nervous disorder. The Englishman eats an amount of hearty food which astounds an American. According to our dietary laws, he should suffer all the agonies of dyspepsia, whereas, that disease is almost a stranger to him. His digestion is assisted by an amount of vigorous out-of-door exercise, and by hours of relaxation and rest to which the American is a stranger. The fondness of the Englishman for wading up to his knees in ice-cold water that he may secure a few worthless fish, or for tramping all day through mud and mire for the purpose of shooting a few birds which he is not allowed to carry off the premises, is to us inexplicable. But the truth is, John Bull is a fine sturdy animal, and he believes in cultivating and gratifying the animal part of his nature. The American is too often so utterly engrossed in the accom. plishment of some desired purpose, that he neglects the physical part of his being, upon which his mental powers are so largely dependent for healthy action, and, in consequence, breaks down with his set task, perhaps, but half accomplished.

It is high time for the dental profession to take a new departure in this respect. There are few avocations which make greater demands upon the vital forces than does ours. The mind of the dentist must be constantly alert to meet the ever-varying complications which arise. No two operations are performed exactly alike, and it requires the strictest attention to details, that imperfections may not creep in. A moment's inadvertence may ruin his finest work.

Then again, he is always laboring upon sensitive tissue, often for timid, shrinking, apprehensive patients, and thus his sympathies are constantly excited, and his nerve tension

extreme. Add to this the fact that his occupation requires him to often remain in a constrained, unnatural position, that his life is an inactive one, within doors, too often in an overheated room, that he is subjected to the exhalations of diseased people, with offensive, fetid breaths, and there is little wonder that in middle life the operative dentist usually begins to experience a premature old age.

All these adverse conditions might be successfully combated by a systematic course of outdoor exercise, but the busy operator needs every hour of sunlight for the performance of his task, which can only be accomplished in a strong light. The very hours which are best fitted for recreation, the light of the blessed sun which should regularly fall upon him during relaxation must be utilized in the service of others, and he lives in a forcing house which, while it may tend to develop certain faculties, is prejudicial to perfect physical health.

Dental practice in this country is far different from that of Europe. There are many more long, tedious, and difficult operations performed here. We see fewer patients in a day, and spend more time over each one. Then, too, ours is usually a more *personal* practice than is that of our professional bretheren in Europe. Patients demand the exclusive attention of the dentist, and are not content to submit themselves to an assistant for minor operations. A practice here, while it is more readily obtained, is also more quickly lost. People are less tenacious of old connections, and seek a new dentist whenever they are unable to command the personal services of the old one, so that to retain a practice once gained, it is requisite that the operator have few holidays. Taking little relaxation themselves, our people are not tolerant of those who, professing to be at their service, are not eternally at their beck and call. There may be a few favored practitioners who can afford to ignore these unreasonable demands, but the average dentist must comply or starve.

We have no thorough system of pupilage, nor have we the class of trained assistants that are easily obtained in Europe. Here, any man is as good as his master, if not a little better, and as soon as a pupil or assistant has acquired sufficient skill o extract a tooth and insert a cheap rubber substitute, he

straightway strikes out for himself, and appeals for support to such patients of his preceptor as he has been permitted to meet, urging that he has been enabled to acquire all the methods and knowledge of the latter, and promising the same results for half the price. In Europe, it is not thus easy to step from a subordinate to an independent position. Business moves in certain well-defined grooves, and public sentiment is not thus tolerant of one who desires to supplant an old-established practitioner. The student or assistant must enter upon practice with the good will of his preceptor, if it be in his immediate neighborhood.

But it is not alone the public sentiment of the older countries which condemns such acts. The law takes cognizance of the rights of the master, and forces the student to pass a sufficient term of pupilage to become thoroughly schooled in his business, before he begins an independent career. It is not sufficient for him to learn how to prepare a vulcanite denture. He must be versed in metallurgy and prepared to work gold. In consequence of all these things, there is, in Great Britain and upon the Continent, a class of assistants or journeyman dentists who are content to remain subordinates throughout their lives. They are quite competent to do all the mechanical work without close supervision, and to perform the minor operations of the surgery. They can take the place of the dentist while he may be enjoying relaxation, and patients do not manifest the annoyance at being served by them which is common in this country, where every man is so exceedingly jealous of his independence, and so apprehensive lest his dignity be compromised, that he declines to be served by a subordinate and demands the presence of the principal.

Our methods of conducting a dental practice have their compensating advantages, but they chiefly accrue to the patient. We are quick to seize upon any idea which will result in our good, but the whole fabric of our social institutions is so widely different from that of the old country that it is difficult to see wherein lies the remedy for the constrained overwork of our best dentists, unless it be through the slow growth of an enlightened public opinion. The safeguards which, in England, for instance, are sufficient to protect a dentist from spoliation of his practice through the introduction of

a competent assistant to his patients are inadequate here. If he bind such an one under heavy penalty not to engage in independent practice in his neighborhood, the chances are that the courts would not enforce the penalty, and even should they do so, public opinion would condemn the practitioner who would thus endeavor to restrain unfair competition, and the notoriety of the case would work only evil to the senior, while it would profitably advertise the junior. Recognizing these facts, many of the better class of dentists refuse to recieve pupils, decline to employ competent assistants, and are compelled to get along as best they may, with the help of a girl to clean their instruments and keep everything in order. Dental legislation is doing much to better this condition, mainly through the production of a better educated public opinion. The remainder must rest with the dentists themselves. If, in every city or community, all should agree upon taking one day, or even half a day in each week for needful recreation, no one would be injured, while all would be materially benefited. It is universally admitted that the rest of the Sabbath is profitable, not alone upon moral grounds, but as well from sanitary considerations. The man who works six days in the week and rests upon the seventh, will, in the long run, do more and better work than he who gives himself no rest. But public sentiment demands that, while Sunday shall be given up to rest, it shall not be devoted to recreation, and the dentist who proposes to secure the respect of church-going people must take another day for the out-door exercise so necessary for his physical well being. Although teachers labor but about six hours each day, public opinion demands that the schools shall be closed on Saturdays either for a whole or half holiday. The lawyer, although not confined to such close office hours as the dentist, is seldom found in on Saturdays. Clergymen almost invariably reserve Mondays to themselves. Physicians keep but few office hours, and the rest of their time is spent out of doors, either in visiting patients or taking needful exercise. A system of early closing on Saturdays is fast becoming an established custom in shops and stores and manufactories, that proprietors and employees may have time for personal enjoyment. An old and venerated institution teaches us that wise men divide their time into three parts, whereby they

obtain eight hours for the service of God and a distressed worthy brother, eight for their usual avocations, and eight for refreshment and sleep. The hard-worked dentist cannot cease from his labors for one-third of his waking hours. Why should it not be possible for the profession generally to agree upon a regular half holiday for Saturday?

The time, too, must eventually come when we shall have among us a class of competent assistants. and that without prejudice to one's practice. To this end every dentist should labor, by encouraging a public sentiment which will sustain a dentist in demanding and enforcing sufficient guarantees, that the privilege of introduction and recommendation to one's patients shall not be abused by the trusted junior.

In this country all needful reforms must be accomplished by concerted action and through a popular vote. So imperative do we believe to be this need for more recreation for dentists that we desire earnestly to commend the subject to the consideration of dental societies, that some remedy for the evils under which the profession is laboring may be devised. In the larger cities it ought not to be difficult for the operative dentists to agree upon a day, or half a day, to be strictly observed as a holiday, when offices would be closed, or left in charge of some one empowered to make appointments.

Many of the States have dental laws which forbid the commencement of an independent practice by any who has not the requisite qualifications. While it may be difficult, nay impracticable in many cases, to enforce such enactments, yet we believe they will result in good, through a wholesome enlightment of the public mind, and thus, in the end, bring about a proper settlement of the vexed question of dental pupilage, with the final result of securing a class of trained assistants who will enlighten the labors of an overworked profession.—*Editorial Independent Practitioner.*

## ARTICLE III.

### *Natural Abilities and Mental Attainments Requisite to the Study and Practice of Dentistry.*

BY DR. MORRELL A. WEBB, MARENGO, ILL.

For a man to engage in any occupation, or profession with profit to himself and patrons, he must possess some knowledge of his own natural tendencies, also of his abilities in the direction of the field of labor upon which he expects to enter, and his physical abilities should be taken into account as well.

I wish to present a few thoughts in relation to what is necessary to know about one's self before entering upon the study and practice of dentistry. For a man to possess himself of the required knowledge relating to himself, he must study the works of God in all their different departments, and, for convenience, I shall separate the necessary field of attainment into some of the most important branches:

1. A man must believe in God; he must have a saving knowledge of him, and in so doing he will live an unselfish life, working for the cause of the great truths, not looking for reward so much in this life as in the next; and in so doing he will lead a life of honesty, and have the implicit confidence of those for whom he may labor. He will possess a consciousness that he has done his best for his patients, and thus be much surer of living a long life here, and being able to enter into the glorious life beyond.

2. The dentist must have a thorough education, and thus be able to understand the duties he may be called upon to perform; to understand the causes of the diseases he may treat; to know the composition and origin of the metals and materials which he daily manipulates, and the composition of the medicinal preparations that he administers. And to become acquainted with these things it is necessary for him to study the following sciences:

1. Astronomy, because it teaches him from whence comes the light that so beautifies our world, the size and magnitude of the body which supplies us with heat from its everlasting fires, and, too, that he may become acquainted with those laws which are so wonderfully and perfectly kept, that the movements of the planets do not vary a hair's breadth in a million years, and that he may realize that the laws that govern the construction and destiny of his own body, are no less wonderful and perfect, and that, did man obey the laws of his being, there would be no need of the profession of dentistry.

2. He must acquaint himself with geology, as it teaches him the formation of the earth, of what it is composed, that it holds in its bosom the metals and substances which he is daily using; and that a few of its elements enter into a combination which forms so natural a substitute for the teeth, porcelain, and also that he may be able to present to his mind a clear idea of the composition and appearances of the different periods in the earth's formation, that he may know from whence comes that fuel which enables us to turn nature's darkness into day, and at the same time to drive away the chill winter blast from our hearthstones.

3. He must study chemistry for the purpose of understanding those laws which govern, and the properties of those substances used in the operating room, and laboratory; and the forces necessary to change their forms and nature. He will learn the composition of air, water, metals, vegetable and animal substance, and all other material forms connected with the earth. He will understand the laws which govern the action of metals as used by him; and, in fact a thorough knowledge of chemistry is very essential to a proper consideration and investigation of the Science of Dentistry.

4. He must acquaint himself with physiology that he may know the action and uses of the organs and parts of of the human body, more especially, that he may see the relation one organ bears to another; that he may see how

the improper working of one may lead to the disorder of another; how we are made to realize that a part of the organism is below its normal standard of action; how those white glistening fibres, although microscopical in size, act as the telegraph wires to warn us of approaching danger from external sources, or internal disease; and he will thus learn of the formation and development of the different organs of the body.

5. The dentist must study the science of philosophy to become posted in the laws of natural forces, and of mechanics, in the kinds of electricity and its generation and magnetism as they are connected with natural forces, and with the relation which they hold to man and especially to the dentist.

6. Anatomy next requires thorough mastery to be able to understand the construction and development of the organs of the body, that he may know of what substances the teeth are composed, how they may be altered in density or appearance, what muscles of the head and face act in the process of mastication, at what age the teeth are severally erupted, how they are connected one with the other by nerves and blood vessels, and thence with the general organism, and how, and where they are situated in their relation to the face. In fact, a thorough course in anatomy is desired.

7. The dentist should be posted in matters relating to history that he may converse with intelligence about past events, either as relating to his own calling, or matters generally, that he may see the profit of thorough study and investigation, by the great changes that have taken place in theories and beliefs which once held sway among the most intelligent. He will, by the study of the history of the science of dentistry, perceive how great changes have been wrought in the methods and modes of practice, and be stimulated to continue the good work of separating the dross from the pure, and placing present theory either on broad foundation of facts, or else burying it deep from sight forever.

8. The dentist should be literary in his tastes, that he may study the thoughts, and profit by the expressions of the same, of the best minds of the age, and of ancient times. He should love poetry because he will thus learn of the beauties of nature, at the same time he enjoys the beauties of language, and because his soul will be elevated to nobler and greater deeds, looking towards the elevation of his less favored brethern. By reading subjects relating to his calling, as expressed by the most intelligent minds in its ranks, he will be better able to give his mite of information to help swell the tide of knowledge that bears the profession onward to still greater perfection.

And there are other and numerous branches of knowledge that require study and research. And all taken together help the man who contemplates the practice of dentistry, to better understand himself.

A man, to be a really great man in this profession, must possess genius; he must have the eye of the mechanic, the perceptive faculties of the artist, and the greatest steadiness of hand and strength of muscle.

He must have the eye of the mechanic, too see beforehand the completed operation whatever it may be, and the laws necessary to obey to make it successful, how to shape the cavity, how to leave the margins, how hard to bring pressure to bear upon the walls of the cavity, how to work in unison with the laws governing the metals or substances which he uses in filling a tooth.

He must have the perfection of the artist to see his work clearly in the mind, that he may know where and how each and every movement of the instrument tends to the completion of his filling to the beautiful and original contour of the tooth, avoiding a disobedience of the law, of course, which says "that a thing is only as strong as its weakest part," thus avoiding building a filling out of proportion to the support of its foundations, thereby avoiding (as is often the case) the breaking away of the walls and ruination of the work.

The dentist must be well stocked with nervous power,

that he can stand a continued strain, with but little fatigue; and he must be possessed of the recuperative powers necessary to return his exhausted energies to their normal standard. The nervous strain that the dentist undergoes is a fruitful cause of the breaking down of the physical powers, not only because he has to stand with steadiness and use his instruments with the greatest precision, but because he does not have the rest needed to regain that strength already lost, thus differing from the average physician who is seldom called upon to perform more than one surgical operation a day, and that usually of short duration, thus avoiding that continued strain which the dentist necessarily bears.

I have given only a synopsis, as it were, of those studies and natural abilities requisite to the greatest good in the man, and dentist: and that the more we know of the facts and principles of the world, and, in fact, those which underlie the working of this mighty fabric of the universe, and the more we know of those thoughts advanced by the intelligence of man, (enlightened by research and investigation,) regarding cause and effect, and the nearer we get to the truth of the object of our being, and the great love manifested towards us by the Creator, the nearer we come to a perfect self-knowledge, and the greater, better, and more perfect will be the works of our lives, and those with whom we associate will be the better for our living, and in the end it can be said of each of us: "Well done, good and faithful servant."—*Ohio State Journal of Dental Science.*

## ARTICLE IV.

### *The Study of the Face as an Index of the Brain.*

Dr. Francis Warner read a paper on the above before the Section of Medicine of the British Medical Association, which possesses much interest.

The face is a region of the body well worthy of clinical study. We may observe its form, color, and mobility and

the effects of movement in causing expression. The movement is the outcome of the action of the brain.

The tissues forming the structure which we call the face are mainly the skin, with its vessels and vaso-motor system; the subcutaneous fat; the facial muscles, supplied by the facial nerve, and some of the masticatory muscles, supplied by the fifth nerve.

Most of the variations of facial expression are produced by the facial muscles, which are acted upon by the changes in the brain; and these are the special indications of the cerebral condition to which attention will here be called. The muscles of mastication are less expressive of the condition of the brain than are the facial muscles; they may become the subject of spasm, atrophy (see Case, *Lancet*, January 7th, 1882), or may produce teeth-grinding, as the result of conditions of the brain.

In almost all cases, the best indications of the conditions of the central nerve mechanism are its effects as seen in the spontaneous action of the muscles; and it is by the results that we usually judge of the central condition. Such effects are conveniently spoken of as nerve-muscular signs. Nerve-muscular signs are the best indices of the brain; the change in the brain affects the muscles; these control the position of the visible parts; and, from the facial changes resulting, we gather our information.

We are here studying the results of cerebral action upon muscles, according to well understood principles of physiology; while physiognomy deals mainly with the shape of the brain-case, and the passive condition of the face.

The principal movements of the facial muscles are these:

1. Dilatation and contraction of the facial foramina; probably this corresponds in significance to flexion and extension.

2. Elevation and depression of parts. Such conditions are well seen by comparing the two sides of the face in a case of Bell's paralysis.

3. Retraction and drawing forward of parts, as in grinning and screwing up the mouth.

To examine a face, hold a piece of paper in front of it, with one edge vertical; either half of the face can then be covered in turn. Again the face may be divided into three zones, by holding the paper with one margin horizontal, leaving the forehead above the eyebrows uncovered; or the face below the lower margin of the orbits may alone be exposed, showing the mouth, most of the cheeks, and the alæ nasi; or, again, the middle zone, including the eyes with the upper and lower eyelids, may be viewed alone.

After looking for symmetry in a face, the nerve-muscular condition of the individual parts may be compared. A different condition of the different zones has, possibly, about the same kind of significance as an unequal condition of flexion and extension of the different fingers. A condition of different activity in the three zones of the face is a departure from physiological calmness (*e. g.*, a smile, or snarl); it may be normal or abnormal. An unequal condition of the different zones is very common in "nervous people."

In the upper zone, we have the occipito frontalis and the corrugator supercilii. Here we see the outcome of brain action in those conditions termed grief, surprise, etc., producing muscular action and corrugating the forehead. The occipito frontales are often seen overacting in imbeciles, and in cases of chorea; sometimes, also, they overact as a mere "chronic nervous habit." Symmetry in this zone is usually maintained. In the middle zone asymmetry is less uncommon, but is seen in winking and in ptosis. The important muscles here are the orbiculares oculorum. With megrim, and in conditions of depression, a marked change is often seen in the midfacial zone due to a fulness about the eyes, especially about the under eyelids: the orbiculares have lost their tone; the skin hangs too loosely; the skin of the lower eyelid, instead of forming a convex surface, passes as a plane from the ciliary margin to the lower mar-

gin of the orbit. If the patient be made to laugh, the orbiculares are energized for the moment, and the look of depression is lost.

Passing on to the consideration of the lower facial zone, we see here the most marked effect of facial spasm or palsy from brain-disease—*e. g.*, in hemiplegia and lesion of the crus cerebri. Thus the weakness of the face is well demonstrated by making the patient show his teeth or smile. Now, the muscles of this region are those most commonly seen in spontaneous action in imbeciles; it is these muscles that work awkwardly in nervous one-sided grinning, and in this region we most commonly see asymmetry of the features, due to nerve-muscular conditions. It is interesting to note that this region of the face is the most affected by brain-disease (paralysis), and in "nervousness" (irregularity of the mobile features). Again, it is the levator labii superiors in the lower zone which produces one-sided snarling one of the lowest expressions produced by the human face. In complete development and perfect health the features are usually regular in passive form and in symmetry of movement. In most expressions, the symmetry of bilateral movement is complete; from this we infer that the nerve-mechanisms for each side of the face are intimately connected.

In observing how easily facial asymmetry is brought about, we see evidence that the union of the facial centres is easily dissolved and not very strong, the asymmetry being especially seen in the lower zone; thus asymmetry is produced by nervousness (see one-sided grinning), by the desire to attack (see *Darwin on the Expression of the Emotions*, page 250,) (snarling), or by such defective nutrition or development as produces unequal features when in motion. The higher, more intelligent expressions, are symmetrical. Union of the facial centres is less perfeet than the union between the motor centres of the eyes for the cerebral condition producing "emotion" cannot cause disassociated movement of the eyes. We find here an illustration that symmetry of action as well as symmmetry of structure, is

part of the law of beauty.

It may be remarked as a peculiarity of the facial muscles in man, that they are usually free or disengaged, not mainly occupied in doing a definite work, but their movements are mainly the spontaneous outcome of brain-action. The facial muscles are usually very mobile, and often illustrate the struggle of nerve-muscular actions; this may be seen in the conflict of the muscles about the mouth in the endeavor not to cry. The study of nerve muscular signs in the limbs shows the importance of observing whether "the movement of small parts"—*e. g.* the fingers—be thoroughly good; this kind of observation in the facial region is, I think represented by "the finer movements of expression." These are totally absent in some cases of paralysis agitans, although the larger movements of the face can be voluntarily performed. When fatigued, the brain does not act well in producing the small, fine movements of either hand or face. We sometimes see a nervous play of the features: this, I imagine, depends upon slight irregularity of the muscles producing slight movements. In convulsion, both clonic and tonic, and in tetanus, the larger muscles usually produce the most marked effect.

In observing different types of face, we become at once struck with the fact that some faces express intellectuality, others vulgarity; some faces are very mobile and very expressive, others are passive and immobile.

The peculiarity of vulgar faces may be roughly divided into two elements: 1. Physiognomy or the shape of the brain-case and face, together with the character of the facial tissues, and the structure of the features and parts of the face. Here, probably, we have an example of the co-incident defective or coarse development of the face and the brain. This illustrates the relation of morphology and function, the structure of the face, and the coincident structure of the brain which moves the face. Elements contributing to this character of face are a large under jaw, a thick immobile condition of the facial skin, thick lips, etc. It will be seen that these are mainly con-

ditions in the development increasing the protective character of the skin of the face; the thick immobile tissue is better able to resist the action of external agencies, but it is also less mobile under the action of nerve-muscular changes. The large lower jaw may be very useful for mastication or defence, but it does not serve to increase the play of nerve muscular actions.

2. The second typical characteristic is the nerve-muscular condition of the face. Such signs are more directly indicative of intellectuality of the brain; hence we should study a face as the index of the brain, when it is seen in action as well as when at rest. The mobility in the different zones and the relative condition of the mental nerve-mechanism. These considerations afford some evidence that facial expression results from nerve-muscular action, the outcome of the motor action of that part of the nerve-mechanism which produces mental states.—*Medical and Surgical Reporter.*

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## ARTICLE V.

### *Marshall H. Webb, D. D. S.*

DIED, at Lancaster, Pa., January 1, 1882, of cancer of the colon, Dr. Marshall H. Webb, in the thirty-ninth year of his age.

Dr. Webb's death was not unexpected, the fact of his serious illness having been known for months. It was, and is, however, a subject of gratitude that, although confined to his bed for the last year, he did not at any time through all his long and tedious illness suffer severe physical pain.

Marshall Hickman Webb was born at Marlborough, Chester Co., Pa., October 28, 1844. After the completion of his elementary education, he became, in 1861, a student of Dr Frank Hickman's, who was at that time engaged in the practice of dentistry at Coatesville, Pa.,—Prof. Taylor, principal of Chester Valley Academy, assisting him in his general education. He made rapid progress, and showed

distinguished ability in both his professional and academical studies. Having completed his term of pupilage with Dr. Hickman, he attended lectures at the Philadelphia Dental College, and graduated from that institution in 1867. Immediately after, he commenced his professional career at Lancaster, Pa.

Dr. Webb's consummate skill in operative dentistry and his thorough knowledge of dental pathology, soon gained for him a very extensive practice, and brought his name prominently before the dental profession. He was a member of the Harris Dental Association of Lancaster County, the Pennsylvania State Dental Society, the American Dental Association, the New York Odontological Society and the Odontological Society of Pennsylvania. He was a lecturer on operative destistry and dental histology in the Dental Department of the University of Pennsylvania. He was honorary member of many dental societies, and a delegate to the Medical Congress that assembled in London, 1881.

Dr. Webb was not an ordinary man. By his professional brethren he was regarded as one of the brightest, most energetic, and withal most self-sacrificing workers in the dental profession. His ambition was to place operative dentistry upon a higher plane, and attain this end no sacrifice seemed to him too great. His work was at all times marked with a sincere purpose and an honest conviction.

To the student he was ever ready to lend a helping hand and no one of his years ever had a greater number of private pupils or more ardent and zealous followers. All of his pupils will recall many acts attesting his interest in their advancement, and will say with one accord that they owe Dr. Webb a debt of gratitude for his unselfish devotion.

As a clinical instructor he stood without a peer, gentle but firm, always ready, even eager to demonstrate practically the ideas which he advocated in published essays from time to time; as a student he was earnest and thorough; as a practitioner concientious, capable, and faithful.

He infused life and enthusiasm among his fellows, and was a hearty worker for the success and advancement of the

societies of which he was a member. His efforts in anything he undertook were marked with persistent energy, and though not blessed with a strong physical organism, he was nevertheless, capable of an immese amount of work.

No man toiled harder than Dr. Webb, and probably no one has done so much to elevate the standard of operative dentistry. His operations were faultless in point of execution, and there was an elegance about their finish that was truly fascinating. The skill which he attained gave him a prominence in his profession surpassed by none, and though dying so young he was fairly entitled to rank as one of the most distinguished of American dentists.

Dr. Webb had a love of fun and a fondness for caricature which he indulged without bitterness or cynicism. His arrows were sharp, were aimed with an honest motive, and always hit the mark. His target was the pretender, and no hand has done more than his in so few years of labor to expose shams in the profession and lift up genuine merit to its rightful place. He has written nothing which will not help to make better dentists and better men. It may not be amiss to add that the last work of Dr. Webb is now passing through the press. The manuscript was prepared during his months of illness, which did not in the least affect his clear intellect. The dental student or practitioner who has not read Dr. Webb's contributions to dental literature should by all means do so. His beautiful methods will commend, themselves to every thoughtful practitioner, and he will learn to value thorough operations and to despise slovenly performances more than ever before.

Of Dr. Webb's home life; of his hospitality; of his relations as husband and father, it need only be said he xemplified everywhere and always the traits of a Christain gentleman. Dear, kind-hearted, good-natured Webb! Who is there to take his place?

Dr. Webb left a widow and three children to mourn his loss, a clientage which will not forget his faithfulness, a social circle to which he was endeared, and a profession which will honor itself in honoring his memory.

H. C. L.

We have laid aside a biographical notice of Dr. Webb in order to admit one prepared by his former pupil and friend, Dr. Longnecker; but the occasion demands something more than a passing tribute to Dr. Webb's disinterested and valuable services to the profession. He gave time and effort without stint to teach all who chose to learn whatever improved methods he had devised, and it is safe to say that all over the country better dentistry is being done to-day in many offices as the result of Dr Webb's clinics and teaching. A sad side of the case is that, with the feeling that life was before him,—years of labor,—he gave more of his time and strength for the general good than he could afford to; more doubtless than he would have done had he foreseen the early termination of his career. He has left a widow and three children unprovided for. His record is finished and is before the profession. Already, without solicitation, a score of operators have expressed their sense of obligation and their sympathy by generous subscriptions to a testimonial fund. One of these—an operator of note—remarked in subscribing, "If that pays for what I learned of Dr. Webb it was the cheapest tuition I ever received; it is not simply a pleasure to contribute, but under the circumstances a duty. Many beside myself ought to recoginize the substantial advantages which will accure to them as the result of Dr. Webb's instructions, and which will continue as long as they remain in practice."

The editor of the *Dental Cosmos* has been solicited to act as treasurer, and will gladly receive and acknowledge any subscriptions which may be sent as a token of appreciation of the unselfish work of Dr. Webb and of sympathy with his bereaved family.—*Dental Cosmos.*

## ARTICLE VI.

### *Pulp Nodules and Their Treatment.*

BY H. L. GILMOUR, D. D. S., PHILADELPHIA.

In writing upon a subject which seems surrounded with so much obscurity, both as to cause and diagnosis, I feel to shrink more from the possible criticisms of superficial readers and thinkers, than a sense of the magnitude of what is before me. I propose making reference only to cases in practice which it has been my opportunity to treat, leaving microscopy and deeper scientific research for those less accustomed to the ache and cure contact of every-day practice, but infinitely better able to delve into pulp *minutiæ* and territories still unexplored. The process of pulp calcification has been known for many years, and yet our knowledge with regard to it still remains vague.

My reference, however, is to what is best known as pulp stones or nodules, existing in the pulp tissue, independent of connection with the walls of the pulp chamber. These nodules, according to my own observation, vary in size from grains as fine as sand—more easily felt by pressure between the finger and thumb than seen by the eye—to large irregular shaped nodes, entirely filling the pulp cavity, and conforming to its shape. The dislodgment of these bodies is frequently attained with considerable difficulty. I have found a spear-shaped point most effective in breaking up the mosaic, by simply insinuating the point between the nodules and giving it a twist, when they may be easily removed by a stout nerve hook.

In the year just closed I had several cases, all in upper molars, and with the exception of one case, in the teeth of a gentleman ranging from forty to forty-five years of age, of nervo-sanguine temperaments, grand physical constructions, looking as if sympathy could never be evoked from any source.

The exception mentioned was in the mouth of a lady, and the tooth the first one I can recall where the cavity of decay was deep enough to expose the pulp; this exposure occurred at the *mesio-buccal* horn, the cavity extending under the gum. I made an arsenical application, seeing her, by appointment, the following day to renew the application; at that time I exposed the pulp over the palatal canal, and there came in contact with as large a nodule as I have in my collection. It was easily removed, with two-thirds of the palatal pulp adhering to it; after picking out four nodules, the patient reminded me of removing five or six nodules three years ago from the corresponding tooth on the other side.

There being no necessity for another arsenical application, I dressed the canals with acetate of morphia paste, filling the outside cavity with pellets of cotton and sandarach varnish as is usual in pulp cavity of operations, and arranged for filling the tooth in a week.

Another class of teeth in which pulp nodules exist, are those without a sign of decay, erosion, or outside manifestation of trouble; neither soreness on percussion, thermal changes, or any of the usual diagnostic signs; but a sensitiveness peculiar to the scratch of the finger-nail on the neck of the tooth, not corresponding in severity to the same kind of scratch above or below the edge of enamel (as the case may be) in upper or lower cuspids and bicuspids; so that, in these cases, symptoms and comparative signs are our best and only guides in trying to arrive at a diagnosis, and just here is where caution, courage, and capability go hand in hand with the dental engine, and a sharp spear-pointed bit to gain access to the citadel of pain, and route the intruding foreigner. During the past year, instead of drilling into the crowns of this kind of teeth, making three, four or five arsenical applications to destroy the pulp, I drill a small hole at the edge of the gum or where judgment would direct, so as to enter on the *pulp side* of the nodules; and one application made in this way is as efficient for the pur-

pose intended as five or six entering the crown ; the opening is easily stopped, with no possibility of displacement by attrition, until the next appointment for finishing, if possible, the operation.—*Dental Practitioner*.

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## ARTICLE VII.

### *Plaster of Paris vs. Modeling Composition.*

BY DR. STEWART J. SPENCE.

In the *Ohio State Journal of Dental Science* of November last Dr. U. Smith had an article " About Impressions," condemning plaster and recommending Modeling Composition No. 1. His claim is, that the composition, by compressing the softer tissues of the mouth, provides for a plate which will do similarly, and therefore be more permanently useful.

That provision should be made for this compression of the soft parts by a plate, is of the greatest importance. Harris recognizes it, and recommends, if I recollect right, brushing thin plaster over the impression at the parts corresponding to the soft parts of the mouth.

Richardson dwells upon the subject, and points out that " the tenacity with which a plate adheres, on the application of direct traction, cannot always be relied upon, inasmuch as a well fitting plate will sometimes be readily dislodged in this manner, while, on the contrary, one but illy adapted to the parts, may require considerable force to separate it from the jaw, when acted on in the same way. The most trustworthy test of actual, or practical stability, is firm pressure, applied alternately over the ridge on each side, and in front."—*Mechanical Dentistry*, p 252.

Several other writers enforce the subject, some recommending treating the impression with a coating of varnish at the soft parts, or a few layers of tin foil, and others trimming down the model with a knife.

Harris says: " A vulcanite plate is larger than the mouth by the expansion of the model. Here, the contrac-

tion of gutta percha will prove a very valuable compensation, *also the compression of tissue, made by the pressure of wax.*"—*Principles and Practice of Dentistry*, p 548.

I dwell on this subject because of its importance, and I am glad to see it brought forward by Dr. Smith; but I must disagree with him as to the excellency of the Godiva Modeling Composition, and for these reasons; *It is elastic and pliable.* Though very pleasant to use, clean, and easy of application, it is treacherous. While it is very accommodating in taking the faintest depressions so as to delude the eye of the operator, it will bend out of shape in a wholesale manner. While wax, which has little elasticity, will, in being removed from a tooth, drag just at the tooth, locally, so to speak, the composition will drag not so much just at the tooth as around it, and that for some distance. I have noticed it thus dragged by a tooth away from the tray in lower impressions, thus throwing up that whole side of the impression, Nor is that all, but its elasticity developes itself in another feature, which is, that it has a tendency not to remain where placed. This is most troublesome at the buccal and labial surfaces of the upper jaw, where it becomes necessary to hold the material pressed until quite hard, or it will shrink away. This may be demonstrated by pressing a plaster model into a tray full of the Godiva, when it will be seen that the composition which is above the rim of the tray will shrink from the plaster, *and when pressed up against it will shrink away again as soon as the pressure is removed.* I am not prepared to deny that the pressure of the lips and cheeks may, in some cases, more or less counteract this shrinking away but in others it seems to increase it.

Again, its specific gravity being considerable, and its resistance very slight, it bends from its own weight, when used very warm and soft, thus coming away from the parts where it may have been pressed, and possibly from the posterior portion of the plate, though I am not able to speak positively as to this. A sufficient excess of the material

may prevent it falling from the surfaces which are to be covered by the plate; and unless used *too* soft, I think it is not liable to occur. The same objection applies to the plaster if used too soft.

This pliability would not be an objection with the inferior ridge, and might be some benefit. But when used very soft, it is deprived of the quality for which Dr. Smith recommends it, namely: compression of soft tissue; and the doctor seems to have overlooked the fact that plaster, when used stiff, will do this very thing.

Not condemning this nice material *in toto*, I desire to only indicate its faults, so that those using it may be on their guard; and I would recommend constant digital compression where needed, high flangs to trays, its use when not too warm and soft, and replacing the impression in the mouth after removing and immersing it in cold water. —*Ohio State Journal of Dental Science.*

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## ARTICLE VIII.

### *Uniting Gold to Amalgam in Tooth Filling.*

BY N. W. KINGSLEY, D. D. S., OF NEW YORK.

[Reported to the N. Y. Odontological Society.]

I would like to refer to a use I have been making of amalgam for several years, and which I reported to the State Society some four or five years ago. I advocated at that time that in many instances of large cavities on approximal surfaces,—of bicuspids and molars particularly,—they should be partly filled with amalgam, to be followed at the same sitting with gold, carrying out the filling to the grinding-surface of the tooth, if one desired to avoid a full amalgam filling. Without going into a lengthy discussion of the arguments in favor, or the objections that might be offered, let me say that I have seen a great many of those fillings, and have watched them with much solicitude and

anxiety, but I have never seen a single instance where there has been any recurrence of decay at the cervical edge of the cavity. In nearly every case that I have seen, I have found the amalgam discolored on the surface, but the gold as bright as any gold filling, and the tooth preserved perfectly from further decay. I have been querying, why this result; whether it was attributable entirely to the fact that with the amalgam I got perhaps a closer adaptation to the cervical edge of the cavity than I would with gold, or whether it was owing to some galvanic condition of the different metals in contact or what? But this I do know, that sooner or later the majority of operations, under like circumstances, when made with gold, are giving out at that portion of the cavity, no matter by whom they are made. I say a majority, not because I have had an opportunity of examining all the fillings made by every operator, not because I am constantly seeing the work of the most skillful operators in gold giving out at the point referred to, within a few years. There is not a dentist who is not seeing this almost daily, and among his own patients, if he would but have the candor to admit it. I have been puzzled for an explanation of the success where amalgam has been used in this manner. There is no evidence of shrinkage of the amalgam that is placed in the upper part of the cavity. Whatever amalgam may do under other circumstances, that amalgam shows no shrinkage after it is put in. It remains perfectly tight, and the tooth does not discolor in contact with it. In filling a tooth in this way, the amalgam occupies a third or a half of the cavity, and the gold is immediately forced into it. For some little time the gold will absorb the mercury and take up all the excess. After that ceases, the gold shows its true gold appearance, and unites or welds in the usual way. The filling can be finished as soon as the gold is packed. The amalgam will be found sufficiently hard to be finished up to the cervical edge. We see here two results: one is that the gold has taken up all the excess of the mercury that can possibly be taken from

the mass of amalgam, preventing the possibility of shrinkage; and, secondly, such a filling is in a better condition to make a perfect flush edge at the cervical border. There is little or no risk of the difficulty so often found with gold fillings, of the filling standing out and forming a lodgment for foreign matters, which will end in decay, because the amalgam has not become so hard but that it can be easily brought flush with the body of the tooth. This may be the explanation of the results that I believe will almost invariably attend such operations. I spoke of this before the State Society a few years since with some timidity, for the reason that there is such a prejudice in the minds of almost every one against amalgam,—and especially as the charge is often made that amalgam is only used by those who cannot put in a gold filling. It was not for the reason that gold could not be used, but because I saw gold-fillings were constantly giving out, that I felt obliged to resort to something for the good of the patient, and the result has been so successful and uniform that I felt it a duty to give somebody else the benefit of it.—*Dental Practitioner.*

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## ARTICLE IX.

### *A Case of Gangrena Oris.*

BY D. A. HENGST, M. D., OF PITTSBURGH, PA.

On July 28, 1883, I was called to see Mary N. White, two years of age, with the following history: She had just recovered from a moderately severe attack of measles, and now had a swollen, pale face, œdema about both eyes, but the swelling was hard and painful over both parotid and sub-maxillary glands, and of a shining, glistening appearance; the mucous membrane of the mouth was also swollen and inflamed. Her surroundings were those of poverty and filth, and she had the appearance of an ill-nourished and badly-fed child. Her general condition was bad—pulse 120, temperature about 102°, tongue coated,

had some diarrhœa, and was very restless and irritable. The next day the swelling had become more marked. She had indurated patches on the scalp over left parietal bone, at the occiput; over the glands of the face, on lower lip, and on the upper border of the sternum. About two days after this, eschars formed over all these indurated spots as well as on the mucous membrane of the mouth at a point opposite the last molar tooth on each side. In about one week after my first visit these eschars had sloughed away, leaving deep ulcers, which continued to spread in width and depth until in some of them all the soft tissues were destroyed to the bone. She now presented a most pitiable appearance. On the scalp were two large ulcers about the size of a silver dollar, exposing the bone over its entire base; in a short time the narrow bridge of tissue between them was eaten away, thus exposing almost the entire left parietal bone; back of this, over the occiput, was another extending to the bone and about one inch in diameter. Over both parotid glands were deep ulcers from an inch to an inch and a half in diameter, and of a circular shape. A large section of the lower lip had sloughed away, making it appear like a harelip, and causing considerable difficulty in deglutition. The ulcer on the upper border of the sternum, about three-fourths of an inch in diameter, was the most destructive one, for at the time of her death it had ulcerated its way into the pleural cavity. All of these ulcers had tough and sharply-defined edges, with no inflammatory areola. Those on the inside of the mouth were not as deep or destructive as the external ones. Her general condition now was very bad. Pulse very rapid, high fever every day, with diarrhœa and cough. She continued in this condition until the 23d day of August, when a severe convulsion caused her death.

As regards treatment, when the case was first seen it looked like one of erysipelas of the face, and I prescribed accordingly; but as soon as the eschars formed I began to suspect the terrible nature of the disease I had to deal with.

Then applied strong nitric acid as a cauterant and alterative; repeated this at various times, and afterwards used a paste of carbolized water; but these applications would not check the spreading tendency of the disease, nor change the character of the ulcers.

Internally she was given morphine when needed to calm irritability. Tr. Ferri Chlor., Quinia and stimulants, also nutritious food, such as beef tea, milk, etc This has been to me a very interesting as well as an extremely rare disease, being the first case of the kind in a practice of thirteen years. The slow progress of the disease, and its not affecting the mouth as much as the tissues on the outside, might be brought forward as an argument against gangrene of the mouth. But the course of the disease is not always so rapid. In consulting the authorities upon this subject, I find it described as being extremely rare in private practice, but more frequent in hospitals for children; that unfavorable hygienic conditions constitute a predisposing cause, and that it almost always follows upon some acute or chronic disease, especially measles. In this case the hygienic surroundings were extremely bad, and it followed an attack of measles, M. Barou says he has never known it to occur as an idiopathic disease, and that it is questioned whether or not large and continued doses of mercury have ever produced it. —*Med. and Surg Reporter.*

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## *Death of Dr. Wm. H. Allen.*

At a meeting of the First District Dental Society of the State of New York, held November 7th, 1882, on motion of Dr. Frank M. Odell, a committee of three was appointed to draft suitable resolutions in relation to the death of William H. Allen.

In pursuance of this purpose we present the following:

WHEREAS, in the dispensation of a wise Providence, we are called upon to mourn the loss of one of our most estimable members, it is therefore

*Resolved*, That in the demise of onr beloved brother, William H. Allen, we have sustained an irreparable loss; and that we deeply sympathize in this visitation, with his widow and relations.

And further, that a memorial page be set apart in the book of records of this Society, and that copies of the same, and of these resolutions, be sent the journals for publication, and to his family.

FRANK. M. ODELL,<br>
WILLIAM H. ATKINSON, } Committee.<br>
W. T. LA ROCHE.

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# EDITORIAL, ETC.

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*The Clinics of Dr. W. W. Evans at the Dental Department of the University of Maryland*:—During the Session which closed on the 15th of the present month (March) some very interesting Dental Clinics have been given at the University by a number ot experienced operators which we will notice from time to time in future issues of the JOURNAL. Among the first in the order of date were clinics by Dr. Evans " on Filling Teeth and the Manipulation of Celluloid."

Dr. Evans presented to the class a "Plugger" of his own invention, which was not only entirely new and novel in construction, but the working of which packed the gold so rapidly and smoothly when attached to the Dental Engine, as to command the admiration and approval of the class and the visitors n.attendance. This " Plugger " can be attached to any dental motor, the blow being thoroughly controlled by the finger, stopped at will to pick up gold, and producing such a delicate elastic blow as to commend it above all other " Pluggers " in

use. A very marked characteristic of this instrument is its agreeable sensation to the patient, and its effective working of the gold.

At subsequent Clinics Dr. Evans demonstrated the use of his new Vulcanizer and Heater for Rubber and Celluloid work, which for safety and simplicity cannot be excelled. The following description of the apparatus will convey a good idea of its merits :

In the first place, we have two separable cups united concentrically to form a water aud steam space, the inner cup forming the dry oven, or vulcanizing chamber, and being sufficiently deep for two flasks ; the strength of the cups is carefully tested before they are united. The top is separate, and in the manipulation of celluloid simply rests loosely on the boiler; but in vulcanizing rubber, when steam enters the inner chamber, it is fastened down by several lugs attached to the top, dropping into slots in a ring connected with the boiler and working on inclined planes ; with these it is securely backed by a slight lateral movement. Three balls running through this top and screwing into a triangular platten furnish the means by which the flask, or flasks, is, or are closed. As the heads of the bolts are spherical, the instant you bind them tight in these cup-like sockets—and for this to happen the flask must be closed and will be flush against the top—you render the joints steam-tight, thus doing away with packing-boxes and caps. Another very important feature is that whatever pressure you may choose to exert upon the bolts in closing the flask comes upon the *top alone*, and by this means is avoided that severe strain to which some boilers are subjected by the *down-plungers*. No lock-flasks are needed ; you can view your work at any moment ; cool off when you like, and all without changing the temperature of your boiler. A thermometer, steam-valve connecting boiler and chamber, and a simple safety-valve, adjustable at any desired heat or pressure, complete the apparatus, with the exception of a jacket having a transparent door in the front, through which the flame of the lamp may be watched.

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*Nitrous Oxide Gas.*—Dr. F. C. Reeve in the American Edition of *Holmes' Surgery* makes the following statement.—" Further

experience has not changed the relative position or much enlarged the sphere of action of nitrous oxide. That it is the safest of all anæsthetics has been established beyond a question. In one institution where such administration is subject of record, this gas has been given over 100,000 times, and not only without a death, but without causing in a single instance symptoms sufficiently serious to necessitate transporting the patient home in a carriage. In the city of Philadelphia alone, it has been given over 133,000 times without a death and without any injurious result. Death cannot be justly attributed to it in more than four cases since its introduction.

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*University of Maryland, Faculty of Physic, 76th Annual Session Commencement*, 1888.—The Commencement Exercises of the Dental Department of the University of Maryland will be held at the Academy of Music, Baltimore City, Thursday March 15th, at 12 M. The Banquet of the University Alumni Association will take place on the same evening. The members of the dental profession are respectfully invited to be present at the Commencement exercises. The large number of graduates of both the Medical and Dental Departments will render the occasion an interesting one.

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*Ether Spray as a Cure for Neuralgia.*—Dr. McColganan in the *Southern Practitioner* extols the value of the ether or rhigolene spray for the instantaneous relief principally of facial neuralgia. Since curing himself, he has had occasion to test its efficacy in about twenty cases. The result was invariably a most gratifying success. In many instances a permanent cure was established. He attempts to explain its action by supposing a complete change to take place in the nutrition of the affected nerve in consequence of the intense cold acting as a revulsive.

# MONTHLY SUMMARY.

*The Use of Tobacco by Children.*—Considerable attention is being paid both in the medical and lay press to the subject of tobacco-using among young lads. A well-known female correspondent has made the statement that seventy-five per cent. of school-boys over twelve or thirteen years old smoke cigarrettes probably without the knowledge of their parents, but not unknown to the teachers. She says further that the principal of one of the largest private schools in the country assured her of its pronounced evil effects upon his boys, but that he was so convinced of the firm hold the habit had gained upon them that he considered it as time thrown away to remonstrate or interfere with it. The principal of a grammar school in a neighboring city found on investigation that of the boys under his charge, in age from eight to fifteen, four fifths confessed to using tobacco in some form. The deleterious effects of the drug in arresting the development of children are sufficiently known, but perhaps their importance is hardly realized. A correspondent of the *British Medical Journal* describes a case in which arrest of growth in the organs of generation seemed to be due to this, cause. He was twenty five years of age, and five feet nine inches and a half in height. His penis was small and the prepuce rather long, but not in a condition of phimosis. The testicles were remarkably small, neither being larger than a french bean or, perhaps what more nearly expresses their size and shape, no arger than the testes of a rabbit. The scrotum was not relaxed nor was there any varicocele. There was short dark hair on the pubes. The voice was somewhat high pitched, yet not like that of a woman or eunuch. Though twenty-five, he had not a trace of a beard, whisker, or mustache; nor was there any hair on the chest or around the nipples. The breasts were flat, yet the contour of the lower extremities and lower part of the runk resembled that of a woman more than that of a man.

In observing this man one could but be struck with the evidence of development on a manly type up to a certain period, and then of a cessation of further virility. His manly height and muscular development ill accorded with the entire absence of beard and weakness of expression. In these respects he differed from the short, rounded, plump eunuchs produced by robbing children early of their testicles. In searching for a cause of this arrest of development, we ascertained that he had not suffered from mumps, nor from any inflammation of the testes. There appeared, indeed to have been no disease which could have checked the growth of these organs. He, however, stated that he was an inveterate tobacco-chewer, preferring a good "quid" to victuals; and that he commenced this habit at the early age of nine, by stealing from his father's pouch what he could not afford to buy. His mouth, at the time of examination, was occupied by a "plug," and there was further evidence of the habit in the staining of the teeth where the dentine was exposed. In the absence of any other cause to which this condition of generative organs could be referred, the writer was inclined to attribute their arrest of development to the poisonous effects of excessive chewing of tobacco.—*Boston Medical and Surgical Journal.*

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*An Idea on Amalgams.*—One great objection to amalgams is that they shrink and turn black, consequently stain, disfigure and destroy the organs that you are trying to beautify and preserve. That heat expands metallic substances is a fact well known to the most casual observer, the expansion being a rupture, a breaking apart of the crystals of which it is composed, —this being nothing more or less than the annealing process of all metals; but if this process goes into a *vacuum*, and by annealing and re-annealing, and subsequent melting, you have then a product that does not undergo such changes.

Annealing of metals in *free air* tends to soften them, for the reason that has been given, *i. e.*, cracking; whereas this new method of annealing produces an opposite effect, making metals harder, more ductile, and what is of greater importance, their density is entirely changed. Then by amalgamating with pure mercury (just so much and no more) you should have but little

or no shrinkage, and no oxydation whatever. Now when this amalgamation takes place, more or less heat is evolved, but i this heat is allowed to depart before inserting the material in the cavity, it will *not shrink*, because crystallization at *low temperatures* is not a process of contraction. This is easily proven in observing the crystallization of water, "freezing," and the consequent bulging or bursting of pipes or vessels in which it is contained. Hence, the laws which govern all substances in passing from a fluid, or a semi-fluid, to a solid state, and the laws that control these substances during the process of crystallization, should be thoroughly understood by all operators. So, upon the proper choice of materials, and intelligent manipulation of them, depends the success or failure of a *plastic* for filling and preserving teeth. And without this knowledge, and the action and numerous changes these substances undergo during the various processes of manipulation, your labor and time is lost.—*Ohio State Journal of Dental Science.*

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*Carbolic Acid Poisoning.*—Dr. Ingessii in *Bulletin General de Therapeutique*, has arrived at the following conclusions respecting this: First, the symptoms of poisoning by external application of carbolic acid are the same as those which arise from the absorption of the poison by the stomach from the gastric mucous membrane. Second, poisoning occurs certainly where the acid has been applied to the skin or injected into a serous, mucous, or abscess cavity. From the exposed surface of a wound the absorption is very slight, and the toxic effects trifling. The mucous membrane of the respiratory passages may serve as the place of introduction of the poison. Third, the effects may assume a very acute form, a less acute form or a chronic form. Fourth, there exist certain idiosyncrasies; women and children are especially liable to carbolic acid poisoning. Fifth, the toxic dose is variable. In persons predisposed, on grain of carbolic acid may be sufficient to poison. Sixth, carbolic acid as an application to contused wounds should be used with caution, and in some cases should even be substituted by a less dangerous agent. Seventh, the treatment of severe carbolic acid poisoning should consist in artificial respiration and diffusible stimulants, especially the hypodermic

injection of ether. In other cases the removal of the cause, through the discontinuance of the remedy, will suffice to remove the symptoms.—*Druggists' Circular.*

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*A New Hypnotic and Depresso-Motor.*—Herr Schiffer, of Berlin, has recently been studying the action of guachamca, a Venezuelan plant. It acts very much like curare, in allaying spasm, and in large doses causing a general paresis. The juice taken from the plant in the rainy season makes the most powerful preparation. If ten milligrammes of the extract are given to a frog, an interval of fifteen to eighteen minutes passes before any effect is noticed. After this period, however, the action is rapid. The animal becomes stupid, allows the head to fall, permits itself to be laid on its back, and does not draw back the leg if extended, etc. So far its action is exactly similar to that of curare; but now comes the difference. The respiration continues, the circulation and cardiac activity are undisturbed. Its effect was tried on a young man in Frerich's clinic who was suffering from cramps. Ten milligrames of the extract were injected, but for three-quarters of an hour no effect was observed The patient then, in broad daylight, suddenly fell into a rather deep sleep, which lasted for nearly three hours; respiration and circulation were undisturbed. Schiffer believes that in guachamaca we have an agent capable of combating disorder of the motory apparatus, as well as a useful hypnotic.—*Medical Record.*

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*Influence of Electric Light on Health.*—The influence of the electric light on health was lately discussed at a meeting of the Hygienic Society of Hamburg, and Dr. Kruss, gave his views on the subject at some length. He referred to the influence of the electric light on the human eyesight, and expressed his opinion that it produces no evil effects, the light having a violet tinge under most circumstances. The electric light being free from the disadvantages incidental to the combustion of gas, in the comsumption of oxygen and the production of carbonic acid, he considered its development as being a hygienic measure of importance.—*Med. and Surg. Reporter.*

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## ARTICLE I.

### *Are Dentists' Exempt from Jury Duty?*

THE FOLLOWING CASE IS OF INTEREST TO THE PROFESSION.

*Letter of Counsel*, WASHINGTON, D. C., *February* 10*th*, 1883.

Dr. ——

DEAR SIR: As a counsel for the Washington Dental Society, we are requested to communicate with you as a member of said society, and to give you the result of our research and investigation as to the question whether a dental surgeon, duly licensed as such by a college having the requisite faculties, or by a university, and practicing his profession in the District of Columbia, is exempt from jury duty in this district. You may remember that the late lamented Judge Olin held, in the case of Dr. ——, a dental surgeon summoned as a juror, that he was exempt from jury duty. The case is not reported, but you can find from Dr. —— the occasion of the decision and the reasons given by Judge Olin. Our act of Congress on the subject of exemptions, and the only act of Congress on the subject, was passed June 16th, 1862, just about nine months before the Supreme Court of the District of Columbia was organized. It is incorporated in the Revised Statutes of the

United States relating to the District of Columbia, section 875. It is affirmative legislation, and may not have the effect of repealing prior laws making exemptions not therein mentioned, as in the case of The King vs. Pugh, 1 Doughlas, 191, where Lord Mansfield, delivering the opinion of the court, said: "We have considered this matter very fully, and we are all of opinion that the statutes relative to juries' being affirmative, do not take away the prior exemption." The only Maryland acts of assembly touching exemptions from jury duty, which were passed prior to February, 1801, when Congress passed the act adopting the laws of Maryland then in force, were the acts of 1715, ch. 37, § 4, and 1797, ch. 87, § 6, neither of which related to physicians or surgeons. It is remarked by Chancellor Kilty, of Maryland, in his report to the Maryland Legislature on the British Statutes, in force in the provinces, page 230, that the statute of 5 Hen. 8, chap. 6 (1513,) although in its terms applicable only to surgeons of London, is supposed, together with others respecting physicians, to have extended to the kingdom generally." It is stated in 3 Bl. Comm., 364, that the exemption from serving on juries is extended by divers statutes, customs, and charters, to physicians and other medical persons; and Kilty says: "It has not been the practice to summon them on juries in the province or in the state, although they are not exempted by the act of 1715, ch, 37, from which it may be inferred, that these statutes extended to the provinces." Chancellor Kilty was the Chief Justice of the Circuit Court of the District of Columbia. His report on the British Statutes, existing at the time of the first emigration and by experience found applicable, was printed and distributed under the sanction of the state for the use of its officers, and is a safe guide, says Judge Buchanan, delivering the opinion of the court in Dashiel vs. Attorney-General, 5 Harris & Johnson, p. 403; and Alexander, in his Collection of British Statutes in force in Maryland, p. 277, says, that surgeons, physicians, and other medical persons are not even exempted from jury ser-

vice by the Maryland Code, but that they are exempt, as it is presumed, by force of these early statutes. Alexander gives in full the text of act of 5 Henry VIII., cap. VI., as being still in force in Maryland, and thereby surgeons are exempt from jury duty and also barber surgeons. Letters-patent were granted in first year of Edward IV. to the freemen of the mystery of barbers using the mystery or faculty of surgery, by which they become a corporate body. In the 32d year of Henry VIII., as there were two distinct companies in London "occupying and exercising the science and faculty of surgery," the one company being called "The Barbers of London" and being incorporated, and the other company being called "The Surgeons of London" and not being incorporated, both companies were united and made one body corporate by act of Parliament, 32 Henry VIII, cap. 40, and called by the name of "Masters or Governors of the Mystery and Commonalty of Barbers and Surgeons of London," and they were made exempt from inquest duty. It was enacted by the same act, that "no manner of person within the City of London, suburbs of the same, and one mile compass of the said City of London, * * * shall occupy any surgery, letting of blood, or any other thing belonging to surgery; drawing of teeth only except." And surgeons within the same limits were forbidden to "occupy" or "exercise the feat or craft of barbery or shaving." The said corporation of barbers and surgeons continued until 18 George II., when the surgeons and barbers were made two separate and distinct corporations, reserving the privileges each were entitled to under Stat, 32 Henry VIII., to each company severally, vide Stat. 18 George II., cap. XV.

The barbers continued to have the same privileges after 18 Geo. II., as before, "so far as the same do not concern or relate to the art and science of surgery," and "with respect to everything but surgery." The surgeons so continued to be incorporated till 1800, when the Royal College of Surgeons was established. As the statute of Henry

VIII. allowed the barbers to continue in one part of surgery, the drawing of teeth, and prohibited them from practising every other part of surgery, even treating the diseases of the teeth, the barber, who was a mere tooth-drawer, so far as surgery is concerned, after the act of Henry 8, chap. 40, was not, it would seem, allowed to practice this part of surgery after the act of George II. for reward or compensation. Thereafter dentistry arose and has made such wonderful strides that parliament, in 1859, recognized them as surgeons, and granted authority to the Royal College of Surgeons to give diplomas in Dental Surgery. Dentists were not barbers, as has been vulgarly supposed, although barbers were at one time surgeons. The dentist was a surgeon from the start and after the surgeon had ceased to be a barber. He draws teeth, it is true, but he draws them very seldom, and only when absolutely necessary. He is not a destroyer or extirpator of teeth. He is a preserver of them, so intimately acquainted with their structure and organism that he can replant them when necessary, and even transplant teeth from one person to another. He understands all their diseases and the treatment of them, and all the diseases of the oral cavity and their treatment.

The barber, whilst a mere tooth-drawer in surgery, was exempt from jury duty. The surgeon was, also, exempt as we have above seen. The policy of the exemption was on account of the inconveniences and possible hurt or even danger to the public by reason of the absence from their professional duties of persons specially skilled in any part of the healing art. The act of George II. exempted surgeons, after their separation from the barbers, from all "parish, ward, and leet offices, and of and from the being put into or serving upon any jury or inquest," and provides that any surgeon summoned and returned to serve on a jury "shall be absolutely discharged from the same," and the return "shall be utterly void and of no effect."

The act of 6 George IV., c. 50, § 2, specifies the persons exempted from jury duty and declares that their names

shall not be put upon the jury lists, and, among others, "all surgeons being members of one of the royal colleges of surgeons in London, Edinburgh, or Dublin and actually practicing." Now, it was an inconvenience to the public and a hardship on the dental surgeon that he should not be exempt from jury duty when he was recognized by Parliament and by the Royal College of Surgeons as a surgeon, simply because he might not be a member of one of the royal colleges of London, Edinburgh, or Dublin. This patent incongruity in the law was corrected by Parliament by an act passed July 22d, entitled "An act to amend the law relating to dental practitioners." It provides first for the registry of persons qualified to pursue the profession of dentistry, and then enacts as follows: "Every person registered under this act shall be exempt, if he so desires, from serving on all juries and inquests whatsoever, and from serving all corporate, parochial, ward, hundred, and township offices, and from serving in the militia."—(Law Reports, Stat. 13, page 269.) This act clearly shows that dental surgeons are within the classes of persons which it is within the policy of the law to exempt. At the annual meeting of the Metropolitan Counties' Branch of the British Medical Association, held at Crystal Palace in July, 1881, Edwin Sanders was elected president in place of Sir Henry Thompson, and in the course of his address said: "Concurrently with a rapid and brilliant advance in the science and art of dentistry, due to a large extent to a wave of progress which reached this country from America, there arose an increasing demand for and an appreciation of its services on the part of the public." He was speaking of a time before the year 1860, and then speaking of the want felt after that time for a registry as a check to the intrusion of the unprincipled and uninstructed, he says; "This has now been happily accomplished by the dentists act of 1878, and thus legislative sanction has been obtained for a scheme not directed to give prominence to the educated and qualified few, but to raise the whole body of the profession; not

to accentuate the distinctive character of the specialty, but indissolubly to unite it to the great surgical body through the examining board of the Royal College of Surgeons." Dental surgery has a section in the International Medical Congress. It has, also, a section in the American Medical Association. The universities of *Maryland*, Michigan, Pennsylvania, Iowa, Tennessee, California, Vanderbilt, Howard, and Harvard have organized in connection with their medical departments, as you well know, departments known as dental departments, and confer the degress of D. D. S. We know that in England before 1862, the date of the passage of the act of Congress, the dental surgeon was treated as a surgeon and dental surgery as a branch of surgical practice, and this was due, said Professor Sanders, to "a wave from America." In this country, therefore, prior to 1859, when the act of Parliament was passed giving the Royal College of Surgeons power to grant diplomas in the specialty of dental surgery, the dental surgeon was recognized as one having not only a professional standing, but as having a specialty duly recognized as a part of medical science. In this condition of things the act of Congress of June 16th, 1862, was passed, and in 1874, § 875 of the Revised Statutes D. C. was enacted, whereby it is provided that all practicing physicians and surgeons shall be exempt from jury duty. Can it be said that a dental surgeon in 1862 or in 1874 was not fully recognized in this country as well as in England as a surgeon?

The act says all surgeons shall be exempt. Who is a surgeon? What is a surgeon?

There is a current idea that a surgeon is one who cuts and carves the human frame, and hence the words scalpel of the surgeon are so often found in alliterative company, like the words palette of the painter, sword of the soldier, or brief of the barrister. The word surgeon does not necessarily imply the idea of cutting, for, if so, the lithotritist would not be a surgeon. The word *surgeon* is derived from the old French *surgien*, which is a contradiction or rather

corruption *chirurgien*, (the chi being pronounced she in this word in French) which is made up of two Greek roots signifying "hand" and "work," and is applied to one who practices "that part of the healing art which relates to external diseases and their treatment, especially to the manual operations adopted for their cure." (Worcester.) See, also, to the same effect, Webster, Jacob's, Tomlin's Law Dictionary, Dunglison's Medical Dictionary and Cooper's Dictionary. The lithotritist, although he may be a surgeon of greatest skill, is not likely to have the same skill for the diseases of the ear or eye, of the teeth or throat, as the aurist or oculist, as the dentist or laryngosopist, and is not the less a surgeon because he refers to the laryngoscopist all cases where the throat is diseased, to the dentist, where the teeth or oral cavity are diseased, to the aurist where the ears or contiguous parts are diseased, and to the oculist where the eyes are diseased. If the aurist be a surgeon, and he is so described in the dictionaries, is he less a surgeen because he lets the lithotritist grind a stone or the embryotomist crush a fœtus? If the oculist be a surgeon, and he is so described in the dictionaries, is he less a surgeon because he lets an ovarian tumor be removed by a specialist in that line? If the laryngoscopist be a surgeon, and his cunning is so new that he is not as such mentioned in the dictionaries, is he less a surgeon than his older brother the dentist, who is old enough to be described in the dictionaries, and who is described therein as a surgeon, because the surgery of the teeth and adjacent parts are by him, the laryngoscopist and all the other surgeons, confided to the dentist?

We think the dictionaries well describe aurist, dentists, and oculists to be surgeons. We look at Worcester and we find: Aurist, "a surgeon who treats diseases of the ear;" dentist, "one who devotes himself to the study of the diseases of the teeth and their treatment; a surgeon of the teeth, called also dental surgeon and surgeon dentist;" oculist, "a surgeon who occupies himself chiefly with the management of diseases of the eye."

We think that when the act of Congress says all surgeons shall be exempt, it cannot be successfully maintained that some surgeons are not exempt, and especially that some such surgeons as it is the policy of legislation to exempt, are not exempted. It would have been wiser to particularize the surgeons to be exempted, and select only such surgeons as have been licensed by some standard college or university, as Parliament has done; but we are dealing with the act as it is, and not as it ought to be. We think that you are exempt, and that His Honor Mr. Justice MacArthur will permit you to test the question in the court in general term. Assert your right to exemption by challenge and motion, supported by affidavit.

Yours truly,

APPLEBY & EDMONSTON.

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IN THE

*Supreme Court of the District of Columbia*

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*In re* Dr. —— } Circuit Court, February, 1883.

MOTION.

Dr. —— now comes into this court, this thirteenth day of February, A. D. 1883, and challenges himself as a juror, and moves the court to discharge him from jury duty, on the ground that by the law he is exempt, for the reason that he is a practicing surgeon in the District of Columbia, as shown by the affidavit filed herein, which he tenders himself ready to verify.

Dr. ——.

Witness:

GEO. F. APPLEBY.

ORDER OF COURT.

In the matter of Dr. ——, praying a discharge from jury duty, because he is a dental surgeon, practicing as such, the motion and affidavit in support thereof are hereby respectfully referred to the Court in General Term, there to be heard in the first instance.

MACARTHUR, *Justice.*

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AFFIDAVIT OF DR. ——.

This affiant, having been duly sworn according to law, states that he is a resident of the District of Columbia, a citizen of the United States, over twenty-one years of age, and has never been convicted of any felony or misdemeanor whatever.

This affiant further states, that for more than twenty-five years he has practiced the profession of a dental surgeon and still practices; that he was licensed to practice said profession by a College of Dental Surgery, chartered by an act of the Legislature of the State from which college he was graduated, having pursued the full course of study here prescribed. That he has a diploma of said college admitting him to the degree (chirurgiæ dentium doctoris) of a Doctor of Dental Surgery (D. D. S.) That the *curriculum* of study in said college embraces pathology and therapeutics, anatomy and physiology, chemistry and materia medica, oral surgery and metallurgy, as well as operative and mechanical dentistry. That by said studies a knowledge of the pathological relations of the teeth to the other parts of the system is obtained, together with the symptoms, causes and treatment of all diseases which involve the dental structure, such as inflammatory action affecting the various tissues, diseases of the dental pulp, periodontitis, alveolar abscess, dental exostosis, dental caries, necrosis, &c., &c.; that thereby knowledge, is obtained to ensure

careful attention to the chemistry of metals, and to the vital chemistry of anæsthetics; that thereby knowledge is obtained so as to construct and apply instruments and appliances for correcting irregularities of the teeth or dental arch, treatment of dislocation and fractures of the maxillæ, removal of morbid growths, treatment of ulceration of the tongue and any disease of the antrum. That the text-books used in said college and in kindred colleges are Garretson's Oral Surgery, Kinsley's Oral Deformities, Harris' Principles and Practice of Dental Surgery, Richardson's Mechanical Dentistry, Gross's System of Surgery, Paget's Surgical Pathology, Miller's Principles of Surgery, Gray's, Wilson's or Handy's Anatomy, Towne's Dental Anatomy, Dalton's, Flint's, Draper's, or Kuss' Physiology, Fowne's, Rosco's or Wilson's Chemistry, Bowman's Practical Chemistry, Wood's Therapeutics, Biddle's Materia Medica, Wedl's Dental Pathology, Beal on the Microscope, and other works. That for said studies, illustrations are made, both upon the living subject and the cadaver, by dissections of the cadaver, and by diagrams, preparations and models.

This affiant further shows, that he has acquired a large practice in the District of Columbia, and has his time during the hours of the day constantly employed by the very exacting demand of his patients, and sometimes the hours of the night. His patients are oftentimes sufferers from excruciating pain, and require immediate surgical treatment for relief. He has constantly on hand what are called "regulating cases." In these it is necessary for him to see at regular intervals the child or young person whose crooked teeth are being regulated or straightened; in some of these cases daily, and in others two, three, or four times a week. The springs or ligatures which move the teeth towards the position they are designed to occupy, require constant adjusting, and if they are not regularly attended to the patient suffers materially; and if, by neglect to remove them, the enamel should be softened, great and permanent injury may result. The movement of the teeth having

been begun, should go on regularly and uninterruptedly, for if the fixtures are not attended to and altered frequently, so as to keep up the requisite pressure, the teeth will in a short time become more or less fixed and tightened where they are, and renewed movement after a time is not only more difficult, but causes much additional pain and distress to the little patient, the most painful part of the operation being the starting of the movements in the teeth. These cases each range in treatment from one to twelve months.

This affiant further states, that cases are constantly occurring in his practice where arsenic has to be used to devitalize a pulp in order to preserve a tooth. In such cases he is required to see the patient at a certain time after the application is made, in order to remove the arsenic and extirpate the dead pulp. If the arsenic be not removed in due time, the tooth will become discolored and an abscess will most probably result, giving rise not only to great pain and discomfort, but to serious and possibly permanent injury and disfigurement, by resulting necrosis of a portion of the alveoli, or even endangering life through the absorption of pus into the system, causing pyæmia.

This affiant further states, that, being in full practice, he is constantly consulted by patients for the treatment of abscesses occurring at the roots of "dead" teeth, of necrosis of the alveoli or any portion of the maxillæ, for treatment of the disease of the antrum, ot ulceration of the tongue, of tumors of the gums, of fractures of the jaw and teeth, and in cases of interrupted second dentition. In the last named cases a reflex constitutional disturbance is oftentimes caused by interrupted second dentition, which is overlooked by the medical attendant, and serious nervous derangements have resulted to the young subjects, which have been rapidly cured by the application of local surgical treatment.

This affiant further states, that fractures of the jaw, though not occurring so frequently as fractures of other bones of the body, are liable to be met with at any time,

and, when occurring, require prompt, skillful, and continued treatment; and these cases properly belong to the dental surgeon, who has succeeded in their treatment and cure when the resources of the general surgeon have signally failed, as in the well-known case of the Hon. Wm. H. Seward, who was injured in Washington City whilst Secretary of State.

This affiant further states, that teeth, and especially front ones, are not infrequently loosened, and are sometimes entirely knocked out, by accident. The timely aid and special skill of the dental surgeon can replant the teeth when knocked out and render them permanently firm and useful.

This affiant further states, that hemorrhages, resulting from the particular diathesis of the patient and from other causes, frequently follow the extraction of teeth, sometimes immediately and sometimes after the lapse of hours and days. Secondary hemorrhage, when occurring, is known by physicians and surgeons to be more dangerous than primary, and these cases are always treated by the dental surgeon, as he by his special education and study of the detailed anatomy of these parts, is better qualified for their treatment, and when such cases come to the notice of the physician they are generally referred to the dental surgeon. And this affiant further states, that he has constantly on hand, and there is not a dental surgeon of full practice who has not, cases which require continued and frequent treatment and applications of medicaments for days and weeks, governed by the diathesis and constitutional condition of the patients.

This affiant further states, that he has books and pamphlets in his possession or control by which, it will appear to the court, that his profession is regarded as an important collateral branch of medical science. That the Universities of Maryland, Harvard, Pennsylvania, Michigan, Iowa, Tennessee, Howard, Vanderbilt, and California have instituted and organized, in connection with their medical

departments, departments that are known as Dental Departments, which are now in active operation, and confer the degrees of D. D. S, ; that the American Medical Association has established a section of dental surgery; that on September 8th, 1859,, by act of Parliament, power was granted to the Royal College of Surgeons to examine candidates for the diploma of Licentiate in Dental Surgery, and to grant that degree ; that in the International Medical Congress there is a section for diseases of the teeth or dental surgery, and that Edwin Saunders, a celebrated dental surgeon, is president of the section ; that the Congress has been addressed by various eminent dentists from different parts of the world, and all the proceedings are published in the *British Medical Journal.*

This affiant further states, that, being a regularly-bred and duly licensed dental surgeon, practicing his profession as such, the performance of jury duty would work material injury to his interests and injury to many of his patients, and to some of them probably serious injury ; that he is advised by counsel for the Washington Dental Society, of which he is a member, after mature deliberation by such counsel, that he is exempt under the law from jury duty. That he is advised by said counsel to assert his privilege by a challenge as well as by a motion, supported by affidavit, as herein done. He appends hereto the letter of said counsel, and the other papers herewith exhibited and filed. That he is informed and believes that this court, Justice Olin presiding, has held that a dental surgeon is exempt by the law from jury duty, the occasion being the summoning of ———, D. D. S,. to do jury duty.

This affiant further states that he tenders himself ready to verify all the matters herein stated or in the foregoing motion stated, and that the notice and summons exhibited to the court herewith and hereto appended is the notice and summons served on him as in the motion stated.

———.

Subscribed and sworn to before me, this 13th day of February, 1883.

R. J. MEIGS, *Clerk*,
By J. J. CAMP, *Asst. Clerk.*

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## ARTICLE II.

### *The Hygienic Relations of Artificial Dentures.*

EDITOR OF THE AMERICAN JOURNAL OF DENTAL SCIENCE.

*Dear Sir:*—Allow me to make a few remarks on Dr. Kirk's article, in Dental Cosmos, for March 1883, on the above subject, in the hope that the readers of your valuable JOURNAL may contribute their experience in the matter and give it the publicity so much needed.

After twenty-two years experience I have found that there is no best material for artificial dentures, while some can wear vulcanite, others will have their mouths ulcerated after wearing a plate of it for a week. In metal anything under 18 carat is unreliable, 16 carat gold turning quite black, and in the same mouth a vulcanite plate has been worn with comfort and without injurious effect for ten years. I have seen some of the rubber pieces after two years wear, turn so soft that they had the appearance of leather, other rubber bases had absorbed the secretions so thoroughly that not even strong acids would remove the foul odor that they emitted.

I may mention that it depends entirely upon the preparation of vulcanite whether it is fit for the mouth or not. I have a vulcanite piece in my mouth made in the year 1870, and it is at this moment as free from odor as the day it was made; while I have never experienced the slightest inconvenience, and the tissues have remained healthy throughout this long period. It is made of pure black rubber, (not colored,) faced with Ash's 11 pink, and I attribute its durability to the care in working it. It was vulcanized first for a long time, say one hour and a half

in plenty of steam at 250° Far. and finished off at 300° for two hours. Its surface is very little changed and has never been repolished; my only treatment is washing daily in warm soap and water with the addition of a little chalk. A most important point in vulcanizing is, always use a clean boiler for each steaming.

I have found that over cooked rubber is very injurious, becoming very absorbent and causing a constant irritation. Another cause of rubber being condemned is, it is often put in the mouth in a rough unfinished state, causing great irritation, which sometimes has had the appearance of saturation, while the same piece being properly trained and highly polished, has given no further trouble. Of all metals that I have found giving the best result, platina with pure gold solder stands first. By careful manipulation it can be made to hold by suction independent of its extra weight, and highly polished plates of this material, I have seen, after fifteen years, giving the greatest satisfaction, both to myself and patient.

Continuous gum work for complete sets, also gives the best results, after six years wear the mouth remains healthy and very little absorption is noticable.

Celluloid is not thoroughly reliable unless made between metal moulds and under a heavy pressure; if pressed between plaster moulds it is impossible to get the surface sufficiently hard; no amount of polish will resist the action of the fluids of the mouth, unless celluloid is protected by that coat or surface that steaming between metal dies gives to it. It is the material that absorbs the fluids of the mouth quicker than any other dental plate, while for a smoker it is useless, turning in a short time completely black or brown throughout the denture and emitting an offensive odor; while vulcanite will be found only coated or glazed and can be made clean again by scraping and polishing.

*Celluloid Cannot be Restored.*

A combination such as gold and vulcanite, dental alloy with silver solder, and low standard gold I have noticed

always cause an inflamed state of the mouth. The first by the two materials not uniting, allowing a deposit to accumulate between the plate and rubber base and becoming decomposed, the latter by their being quickly acted upon by weak acids causing a metallic taste and fermentation of certain foods deposited upon them during the day, and the rapid decomposition of the inferior metals used as solder for low standard metals.

G. A. D. G.

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## ARTICLE III.

### *Odonto-Chirurgical Society, of London, England.*

The Ordinary Meeting of this Society was held 8th February, 1883, Dr. Smith, F. R. C. S. Ed., President, in the Chair.

The following Paper on "Alveolar Abscess, its Pathology and Treatment," was read by Mr. Watson, L. D. S. E lin. :—

Definition.—A collection of purulent matter contained in a sac attached to the radical extremity of the tooth, and formed or deposited in the alveoli or substance of the maxillary bones. (Varieties). Acute and Chronic.

Causes.—(*a*) Local. Mechanical injury from blows, resulting in loosening or fracture of tooth, injury produced by mechanical appliances in the treatment of Dental irregularities. Mechanical impact of the bite and caries, which is by far the most common cause of alveolar abscess.

(*b*) Constitutional.—Any of the Exanthemata, Pregnancy, Syphilis, Maleria, and certain medical substances, any of which, owing to the alteration or derivation of the nutrition from the dental organs, are liable to re-act on the periosteum and pulps of weak members of the denture, and so lead to alveolar abscess.

Pathology.—The irritation set up by a diseased root or tooth speedily affects the alveolar periosteum, produces hyperæmia and thickening of this membrane, raising the

tooth in its socket and making it painful on pressure, then follows plastic exudation around the apex of root or roots, which through time becomes organised into a dense fibrous sac of connective tissue, the bundles of which mainly run a concentric course around the abscess and are continuous with the healthy or slightly inflamed periodontinal membrane higher up the root; this forms the abscess sac, within which the pus is formed: With the first deposition of plastic lymph at the extremity of root, the surrounding bone becomes absorbed to make room for the expanding sac, but the rapidity and extent of this destructive action is very much more accelerated when suppuration ensues, in many cases resulting in the disappearance of a considerable portion of the external or internal plate of alveolus, and the pointing and discharge of the abscess through the gum, or if the periodontinal membrane has been destroyed, the pus finds its way along the surface of the root to the margin of the gum

The intensity of the pain from any given abscess is proportionate, not to the size, but to the intensity of the inflammatory process, the length of the roots, and the resistance to absorption made by the hard tissues.

Symptoms of Alveolar Abscess.—I do not think it necessary to detail these, as we are all quite familar with them, and it would be just a waste of time.

Abscesses originating at the extremities of the incisor and canine teeth of the upper jaw generally perforate the external alveolar wall, the fistulous openings being a little below the focus of suppuration. In some cases the abscess opens into the nasal cavity or on the palate, this last more particularly in connection with diseased laterals.

Abscesses in the incisor teeth of the lower jaw are of less frequency than those of the upper, and in nearly every case the sinus opens on the labial surface Alveolar abscesses connected with the upper premolars and molars usually open upon the facial wall of the jaw, and it is not uncommon to find the roots of several teeth projecting into the

cavity of the same abscess. Sometimes the pus, after penetrating the periosteum of jaw, dissects its way along the connective tissue sheaths of the muscles, and escapes through the integument causing buccal fistula, or penetrates the parotid gland, producing salivary fistula. If the extremities of the roots project far into the central cavity, the pus may perforate the mucous membrane and escape into the cavity, or, if the roots are extracted, may give rise to a fistula of the antrum, which is displayed in the specimen I hand round, as a funnel-shaped depression, with a corresponding opening on the floor of the cavity. I have come across and treated several cases of the so-called antral abscess produced by abscessed roots or teeth, and it may interest you to know which produced this lesion in my cases. Four were caused by the first molar, three by the second premolar, one by the first premolar, and one by the lateral incisor ; this last case is interesting from its rarity, and the fact that both anthra became affected, there being an interval of three years between each, the tooth on this other side being the second premolar. With abscesses connected with the molars and premolars of lower jaw there is always great danger of the formation of fistulous tracks along the faciæ, and whether the fistulæ open on the cheek, margin of inferior maxilla, before or behind the ear, upon the nape of the neck or thorax, their true character and significance are too frequently unrecognized, and improper treatment adopted by physicians into whose hands they fall, resulting in permanent deformity to the sufferer, or in some cases even death.

Abscessed third molars, from their position and anatomical relations, are more liable than any other tooth to lead to such results, and this not always from caries and the subsequent destruction of the pulp, as impacted wisdom teeth may also give rise to abscess. I had a good case illustrative of this some months ago,—an old gentleman over 60 years of age was sent to me by his medical adviser in regard to a swelling over the angle of the lower jaw (which

had puzzled them very much to account for). I felt sure it was an alveolar abscess, and one that would soon point on the face; the wisdom tooth and second molar were amissing, all the other teeth being sound. However, over the situation where the wisdom tooth should have been there was a small opening in the gum, and on passing a probe into it it came in contact with what I thought was a tooth. Giving a mixture of gas and ether I managed with difficulty to extract the tooth, which was lying parallel to the body of the jaw, it had a large abscess sac attached to the roots, and proved to be the third molar, which had never erupted. the pulp having by some means been destroyed, irritation had been set up, ending in alveolar abscess.

ACUTE ALVEOLAR ABSCESS.—In acute alveolar abscess the disease runs a rapid course, the symptoms for the time being are very severe, but as soon as a fistulous opening is established the pain ceases, and a chronic condition ensues. This, however, only if the attack has been very severe, in milder cases resolution cuts short the attack for the time being; to recur again, the first exciting cause. The abscess sac in this variety is usually thinner, smaller, and smoother than that of the chronic form.

CHRONIC ALVEOLAR ABSCESS.—In chronic alveolar abscess the symptoms are very much less severe; in fact, there may be little or no inconvenience felt, this being very apt to cause the tooth and its diseased conditions to be overlooked and neglected. It is in such cases, in subjects of a strumous diathises, we are liable to have considerable destruction of bone from necrosis or caries. The continual irritation of the periodontinal membrane in chronic alveolar abscess has a peculiar effect on the roots of teeth, causing in some cases the production of layers, of new cemental tissue (destructive,) or removing part of the root by absorption (destructive,) the one frequently alternating with the other at each exacerbation of the disease. In some cases of chronic alveolar abscess there is deposited at the extreme points of the roots nodules of a very hard greenish tartar, which

must be derived from the vessels of the abscess sac, and is a condition; so far as I am aware, that is not alluded to in any of the text-books. I hand round for your inspection specimens of this pathological lesion.

Treatment of Alveolar Abscess.—Alveolar abscess has become far more amenable to treatment within the last ten years or so, partly owing to its pathology being better understood, and partly to the discovery of so many useful anti-septics, and the anti-septic system of treatment. Teeth which at one time were condemned to extraction can now, by antiseptic treatment, be saved and made useful again. The anti-septic treatment, however, to do good must be thorough; the saliva and all moisture should be excluded by means of the rubber dam, or other appliances, and this not only at the time when the abscess sac is injected, but at every dressing of the tooth the same precautions should be adopted, otherwise very little good will result.

The treatment to adopt will depend on the stage at which the abscess is seen, and whether it be acute or chronic. To simplify matters it will be as well to divide them into two classes: 1st. Abscess with a pus discharging fistula. 2nd. Abscess sometimes called blind, or those without any external opening. Those of the first class are by far the easiest managed, owing to the readiness with which medicinal agents can be applied to the root of the disease. If the tooth has a filling in it, this should at once be removed, the canals freely opened up and cleaned thoroughly with a weak solution of carbolic acid (a weak solution being used to prevent coagulation of pus cells, if such should be present in the canals,) a drop or two of the same solution should now be inserted into the cavity, and a piece of unvulcanized rubber worked up and down like a piston in the cavity, which generally forces the fluid through the sinus; this having been accomplished, pure carbolic acid (the cheek being protected) may now be used, after which the tooth can be dressed, each root separately with pieces of cotton wool or silk, dipped in what I consider

the best and least irritating of anti-septics—a paste of eucalyptus oil and iodoform freshly mixed, and a piece of cotton wool dipped in sandarach varnish applied over this. One or two such dressings usually suffice, although I have filled teeth right away after injecting the sac, and they have done wonderfully well; still it is better practice to give them several dressings before filling, and if need be, another injection of the pure carbolic. Unless the pure carbolic acid passes freely through the sinus, all the dressing that can be applied will do little permanent good, except in a few rare cases. For premolars and single rooted teeth the hypodermic or abscess syringe answers admirably for injecting abscess sacs. Inserting the syringe into the canal of tooth and surrounding the tube with cotton wool dipped in sandarach solution or making it tight any other way, the anti septic fluid can then be readily forced into and through the sinus. In the case of posterior approximal cavities in the molar teeth of upper or lower jaw, I am in the habit of filling up the entrance of the canals with cotton wool, stopping the cavity with amalgam, and when hard, drilling a good sized hole in the centre of the crown, through which the cotton wool can be removed and the tooth very much more readily treated, from the direct manner in which the canals can be reached.

I now come to the second class, viz.:—Abscesses without any fistulous opening. If it be difficult to treat abscesses already fistulous, how much more is it the case with this variety; in fact, these are the most difficult and troublesome cases we have to deal with in practice, and very frequently end in our complete failure to arrest the disease.

There are several methods by which such teeth may be treated. Firstly—By anti-septic dressings applied every two or three days, the administration of a brisk purgative and Sulphate of Quinine in three or four grain doses thrice daily, or Calcium Sulphide in one-tenth grain doses every two hours, either of which have a good effect in promoting the absorption of the inflammatory exudation. Secondly

—Filling the tooth with cement or gutta-percha, and by this means try to produce a fistulous opening. Thirdly—Drilling a hole through the alveolus as near the position of the abscess sac as possible, by means of a drill or small trephine, such as I hand round; keeping the opening patulous by means of cotton wool tents, or what I find better, a piece of doubled up silver suture wire, which should be allowed to remain till the canals of tooth are thoroughly disinfected, and the pus and exudate drained away. Each and all of these methods I employ according to the exigencies of the case, but one has to confess that our methods of treatment are not so accurate, but that we have numerous failures in this class of cases; the principal cause of such being our inability to get a free opening through the canals of the tooth into the abscess sac and sinus, artificial or otherwise.

In cases of alveolar abscess which threaten to open on the face, the tooth should at once be extracted, and if there has been any infiltration of the surrounding tissues, it is a good plan to adopt the precaution of cutting across the fistulous canal, otherwise, even although the tooth is extracted, the infiltrated pus may find its way to the face, and produce a sinus. After extracting abscessed premolar or molar teeth in the lower jaw we sometimes find the swelling increasing afterwards to a great size, and bulging out the external alveolar plate, this being caused by the infiltration into the cancellated structure of the bone, and the rapid proliferation of the pus cells. I have found it useful in such cases to pass a trochar into the socket and open it up freely, so as to drain away the inflammatory exudate. The old and very unscientific operation of rhizodontresis, was performed to prevent, or rather hide, alveolar abscess in teeth, the pulps of which had been destroyed by arsenious acid, and usually not removed. This may be all very well as a temporary expedient in stopped teeth, the pulps of which have subsequently become dead and threaten alveolar abscess; but to do so in every case cannot be too strongly condemned,

and I pity the poor patient who has a number of such teeth, draining the contents of their abscesses through the artificial opening in the tooth into his stomach.

A very prominent question at the present time among pathologists, and one which is of great interest to us dental surgeons, is—"Do the presence of micro-organisms spread and produce or intensify inflammatory action?" That they are the origin of inflammation very few believe, but when they are present they are apt to infect the surrounding structures, and thus spread and intensify the inflammation. In the case of alveolar abscess, with a fistula and a carious open cavity, we can readily understand microzymes to be present in abundance, but one is inclined to doubt their presence in abscesses connected with perfectly sound teeth, the pulps of which have been destroyed by a blow or fall, or in a tooth which has been filled for a number of years, the pulp having been unexposed, but which subsequently has become dead and produced abscess. I recently examined the pulp of one such tooth which had caused abscess, and found it white and sodden, but without any putrid odor, and, so far as I could make out, there were no micro-organisms present. This subject, however, requires patient and thorough investigation before we can tell definitely the effect which micro-organisms have in inflammatory lesions. I have prepared, and will show, several slides with pus taken from abscesses, acute and chronic, the first by asperations from an unopened abscess, the second from a fistulous abscess, and being stained by the most approved method, they, in both cases, show the presence of micrococci and bacteria in considerable numbers.

At the conclusion of Mr. Watson's paper and demonstrations, the CHAIRMAN, who had to leave the meeting earlier this evening, said that he hoped a full discussion would take place on the very interesting communication which had just been laid before the Society. Three points in it presented themselves for consideration. These were—first, the great number and peculiarities of the structures

implicated in alveolar abscess; second, the special characters and distinctive nature of those morbid affections occurring among them, as compared with inflammatory action and its results in other similar tissues, such as those found associated with joints, etc.; and third, the important part played by such agencies as Micrococci, Bacteria, Bacilli, those interesting novelties of late occupying the attention of pathologists and other scientific inquirers. With reference to anti-septic treatment in the strict sense of the phrase, applied in oral surgery of any kind, this could scarcely be carried out in the Listerian point of view—since the adoption of all its essential requirements is here all but impossible. But of the therapeutic, if not the physiological value, of the action of such anti-septic agents as has been mentioned by Mr. Watson, there could not be a doubt.

Dr. Smith then left the chair, which was taken by Mr. Wilson.

Mr. Finlayson thought that no exception could be taken to the scientific part of the paper, which, with the microscopic specimens submitted to inspection, had been evidently got up with care, and reflected great credit on the author. He (Mr. Finlayson) had not seen a case of metastasis such as was referred to, viz., pointing of alveolar abscess in the inner portion of the lower eyelid. With regard to the treatment in cases, he might mention that one he had brought under the notice of the Society in December, and which they would recollect had been treated by being washed carefully out every day with weak carbolic solution, and thereafter the distended walls of the alveolus packed with boracic lint, the first packing being on November 27th, and the capacity of the distended cavity being equal to two fluid drachms. This was done regularly every day, the quantity of packing being gradually decreased, until, at this date, only one fourth the bulk is needed to fill it up. Several sequestra of bone, very thin, had come away, but those he had not seen. The pus had a very light smell, and had along been as nearly as possible laudable. Boracic

lint, as an anti-septic dressing, had in this case proved very useful and non-irritating, as granulation appeared to have gone on steadily from the first.

Mr. Amoore said, Mr. Watson had referred to a subject which was powerfully exercising the minds of pathologists of the present day—the influence of micro-organisms in the production of disease. He had lately been reading the lectures on inflammation by Prof. Burdon Sanderson referred to, and quoted by Mr. C. Tomes in a recent paper read before the British Dental Association at Liverpool. Mr. Watson had stated it to-night as his opinion that some abscesses, namely, those that had no communication with the free surface, were not influenced in their growth by microzymes. This somewhat accorded with Mr. Tomes' views, for in the few cases that he had investigated where the pulps of teeth had died, and in some instances undergone putrefactive decomposition without communication with the exterior, he had not as yet satisfactorily proved the presence of bacteria, or of micrococci in the contents of the pulp-chamber. Professor Burdon Sanderson had entered at some length into experiments performed upon rabbits, which went to show that inflammation-producing organisms "do not exist in the atmosphere, nor in the ordinary aqueous liquids with which our bodies come in contact," and that these micro-organisms are not primary causes of inflammation, but are rather "mischief spreaders" than "mischief makers." An illustration which Mr. Tomes had quoted was a very instructive one, and though it was doubtless known to most of those present, he might perhaps be permitted to briefly repeat it. The method of castrating male animals in the South of France differed from that commonly pursued here. The testis is twisted upon the spermatic cord, so as to completely cut of all vascular connection without injury to the overlying skin. The results are almost invariably favorable, and the dislocated organ undergoes atrophy, the result of this simple inflammation being confined to the directly injured tissue. But perhaps

the most instructive part is to follow. Several animals, previous to the operation, were injected with septic matter —pus from an infective abscess—and in the majority of cases death resulted from septicœmia. Mr. Tomes considered the relative condition of a pulp, severed from its external vascular connections by a blow upon the surface of the tooth, as precisely analogous to that of the dislocated testis in the foregoing operation. A tooth that has thus suffered injury from a blow may remain useful for a long period, or, as frequently happens, after an interval of variable duration, the periosteum becomes inflamed, and abscess ensues. Now, if this is a result arising from decomposition of the pulp, and infection of the tissue therefrom, the analogy is not born out, and it is difficult to account for the abscess; but, if there be infective material in the blood during the period of inflammation of the periosteum, it appeared to him to be more readily comprehensible, as the microzymes would there find suitable "soil" wherein to grow and flourish. He feared he had only repeated what must have been their own conclusions on reading the papers referred to, but he trusted, as the matter had not been brought forward that night, that its important connections with the subject in hand were sufficient apology.

Mr. Macleod said he had listened with some interest and attention to Mr. Watson's paper, and while admitting that in many respects it was a most creditable one, he was constrained to express the disappointment which he felt at its conclusion, in so far that there was nothing in the paper which had not been already most fully discussed at the meeting set apart for that purpose in January, 1881. Now, he was rather of opinion that some advance had been made in our knowledge of the pathology of alveolar abscess, and certainly there had been some contributions to our more exact treatment of this disease, and to these he had expected Mr. Watson would have turned their attention. He (Mr. Watson) certainly made allusion to micro organisms, but did not venture to express an opinion as to the likelihood of their presence being antecedent, concurrent, or subsequent to the inflammatory stage, or if only present when the diseased

structure was or had been in contact with the air. Now, the specimen shown by Mr. Watson of abscess in connection with the unerupted wisdom tooth should have formed an excellent text upon which a few thoughts regarding the evolution of micrococci, etc., might have been hung. Mr. Watson in his paper had made reference to nodules of green tartar at the apices of roots, which were the seat of chronic abscess, and said that its presence was rare, and had never been noticed in text-books. As he (Mr. Macleod) did not know to what books Mr. Watson limited the term, of course he could not say that this was not so, but he could assure Mr. Watson that the presence of green tartar at the ends of the roots, under the circumstances mentioned, was by no means so rare as he seemed to think, and that he would find on more extended reading that its presence was mentioned by more than one author, and still more frequently in the journal literature by writers on the so-called Rigg's Disease. That it is a deposit from the "vessels of the abscess sacs" he very much doubted, preferring to concur with older observers and writers on the subject, that its presence is accounted for by the saliva oozing through the canal or passing between the now disconnected peri-cementum and the tooth. In Mr. Watson's paper there was only one original point, and that was in the treatment of alveolar abscess, and to that he would refer, but unfortunately to take exception to it. He alluded to the filling up the pulp cavity with cotton wool, building up the tooth with amalgam, and, when hard, drilling a hole through the amalgam, and picking out the wool, and then treating through the hole thus drilled. He might suggest to Mr. Watson to try two or three strands of well waxed silk, packing the canals and cavity with these, and leaving the ends sufficiently long to extend below the surface of the crown. When the amalgam set the free ends could be seized and the silk pulled out. This would be found more reliable than the cotton wool business; at the same time he was aware that there were simpler ways, and preferred them. In concluding, Mr. Macleod made some remarks on a form of disease which had occasionally come under his notice, and asked if it might be a low form of abscess. The presence of the disease could, as far as knew, only be ascertained by diagnostic exclusion. Its symptoms were neuralgia, and the

seat of pain varied with the tooth or teeth attacked, but was seldom present in the tooth itself, and if ever so, only as a feeling of tension passing between the tooth and the seat of pain. On extraction, the pulp was in an atrophied condition, pale in color, and the chamber and canal filled with a thin fluid. The root, to generally about one-third or one-half of its length, was quite translucent, this transluency arising very probably from this portion of the root being bathed in the same fluid found in canal, and being deprived of its organic constitutents.

Mr. WILSON said he agreed very much with the remarks already made. As to the so-called green tartar at the apex of a root, he certainly had seen it noticed, and if he recollected it rightly, a well-marked case had been shown at a meeting of this Society some years ago, the production being supposed to be from an infiltration of saliva into the enlarged socket, a cause which seemed to him rather unlikely. As regarded micro organisms in the oral cavity, and their action on the teeth, whether these were healthy or carious, he recommended those members who had not already done so, to read the able article on that subject in the *Cosmos* for January, by M. Miller D. D. S., Berlin.

Mr. WATSON in reply, said—Mr. Macleod in his remarks mentions that I have not gone so deeply into the subject of micro-organisms, and the effect they produce in inflammatory conditions, such as that of alveolar abscess. I have not done so, for the simple reason that I do not wish to dogmatise on a subject I know very little about, and one which only two or three of the most eminent histologists can give any information about. He also says that the presence of alveolar abscess in connection with the impacted tooth referred to in my paper, is a proof that micro-organisms were present; this I utterly deny, as any one who has a knowledge of pathology knows, that abscess can arise independently of the presence of micro-organisms. Mr. Macleod has evidently understood me in the treatment I adopt with difficult posterior approximal cavities in molars. After filling permanently the posterior approximal cavity, I drill a hole in the centre of the crown to get direct access to the canals in the treatment of the abscess. He also seems not quite to take me up in regard to the deposit of nodules of tartar at the extrem-

ities of roots in some cases of chronic alveolar abscess, as this deposit differs entirely from that of Rigg's disease, which is found in the shape of scales scattered over the surface of the root, and not localised to the one spot, as in my specimens.

Mr. MACLEOD claimed a word of explanation. He did not say that the presence of alveolar abscess in connection with the tooth referred to was a proof of the presence of micro-organisms, but that the presence or non-presence of these in this particular abscess would have afforded argument for or against the theory which attributed the origin of this pathological condition to microzymes. Nor did he say that green tartar at the end of the root was an accompaniment of Rigg's disease, but that its existence had been incidentally mentioned by certain authors when writing on that disease.

On the motion of the CHAIRMAN, a vote of thanks was accorded to Mr. Watson.

The CHAIRMAN then intimated that the next meeting, being the Annual Meeting, would be held on Tuesday, the 13th of March, when several interesting communications would be laid before the Society, and he hoped that every member would make a strong effort to be in his place.—*Dental Record.*

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## ARTICLE IV.

### *Treatment of Diseases of the Dental Pulp.*

BY DR. SAMUEL A. WHITE, SAVANNAH, GA.

Among the many operations that the practicing dentist is called upon to perform, there are none probably of a more important character than the restoration to health and usefulness of teeth that have their lining membrane exposed, or their vitality gone.

The dental pulp in its various conditions of exposure, together with the treatment necessary to relieve our patients of continued and occasionally almost unendurable suffering, should at all times receive our very best attention ; and in offering these few observations upon the general treatment

of exposed pulps, and devitalized teeth, I do not claim any particular originality, but would rather offer some practical evidence and the mode of treatment that I have found most successful.

In what I would term a simple or partial exposure of the pulp, without inflammation, the treatment is generally simple, and nearly always successful; where there has been no pain, or the exposure has been caused by accident in excavating, I proceed to remove all decayed dentine from around the edges of the cavity, cautiously approaching the exposed spot, and prepare it at once for a permanent filling. A drop or two of blood showing, instead of being unfavorable, is in many cases a positive advantage, but every indication of it should cease before the filling is commenced. This can be readily acccomplished with spirits of camphor. In this condition, however, as well as in all other exposures of the pulp, there is one consideration of the utmost importance, and that is, that no particle of detached dentine be left to press upon the pulp to produce irritation, or failure would be inevitable. If the cavity is plainly visible and everything prepared for filling, it should be wiped out with alcohol and creosote of equal parts, to be followed with creosote alone, or dilute carbolic acid, then carefully dry and place two or three thicknesses of No. 60 gold, previously cut to fit the floor of the cavity, immediately over exposure, and proceed to fill, first using rather large pellets of soft foil about No. 5, pressed well against the marginal walls, and gradually bringing them over the heavy foil, which should at first be held in position either by an assistant or an instrument held in the left hand. In every case the filling should be finished with cohesive gold, as it is almost impossible either to dove-tail the pellets or introduce them as an ordinary soft foil filling. If the cavity is inaccessible, or particularly deep, or if amalgam is to be used, proceed as above described, only substituting six or eight thicknesses of paper, moistened with creosote, for the heavy foil, and fill with oxy-phosphate zinc, this to be capped with the harder material.

The next condition of exposed pulp, is where pain has been experienced for a greater or less time, produced either by slight thermal changes, suction or pressure. If at the time of examination there is the slightest pain or uncomfortable symptoms, they should be allayed. Chloroform and creosote of equal parts I have found most to be relied upon, except in excessive pain when creosote alone should be used. In the former condition I proceed at once to fill temporarily. Prepare by excavating the marginal walls of the cavity as for permanent filling, leaving that portion over exposure almost untouched, place a small pellet of cotton saturated with creosote next the pulp, removing excess with bibulous paper, and fill with oxy-phosphate zinc. This should remain at least a week or ten days, when, if no trouble is experienced, the whole should be removed and several thicknesses of bibulous paper substituted for the cotton, and a permanent filling introduced. In the other condition, where acute inflammation has been of long duration, I regret to say that the chances of success are not very favorable, although with a little care and perseverance, many teeth of this character can be restored to health and made useful for years. Creosote should be applied once or twice a day until all uneasy symptoms entirely disappear, and the tooth remain in a perfectly comfortable condition for several days. Treatment should then be proceeded with as just described. Care should always be exercised in mixing the oxy-phosphate of zinc somewhat thinner than for permanent work, and using as little pressure as possible in its introduction. Failure here brings us to the consideration of the next condition of pulp exposure, when it becomes necessary to destroy its vitality. In cases of this kind the treatment and subsequent success is very much more assured, although among regular patients I am happy to say seldom resorted to. After reducing all inflammation, by one or more applications of creosote, or either of the essential oils, the cavity should be prepared to retain a filling material. The smallest speck of cotton, not larger than

a mustard seed, merely touched in arsenious paste, should be placed directly upon the exposed point of pulp, and filled over with thin oxy-phosphate of zinc. The most scrupulous care should be observed that no particle of the paste touch the gum or soft parts of the mouth. This should remain in the cavity about twenty-four hours. Upon removing it, care should be used not to bruise or break up the pulp but simply insert a pellet of cotton moistened with creosote and dismiss the patient for forty-eight hours, at which time there will be little or no difficulty in removing the pulp almost entire, by first cutting away the approach to pulp-chamber and then using a barbed broach.

Now comes the most important step, and careless manipulation will only induce failure. In reaming out the nerve-canal, neither air, debris, or point of instrument should, under any circumstances, be allowed to penetrate beyond the apex. I believe that nine-tenths of unsuccessful cases can be traced to want of care in this particular. With the excellent nerve-drills now obtainable, which clear themselves while cutting, there is no excuse for either stopping up the canal or forcing debris through the foramen. As it is all important that these delicate instruments should not break while using them, it would be well to test each in the following manner: Clamp the cutting or bur end between two pieces of soft pine in a vise, and with the fingers turn the handle, using rather more force than would be attempted within the tooth.

In all nerve cavity cases, except those having an outlet through the alveolus and gum, and I may also except the six front teeth, of which I shall speak hereafter, it is necessary, in their treatment, to fill the fangs in such a manner that the entire filling can be readily removed in the event of trouble. This should be provided for in every case.

The material I have employed the past six or eight years for this purpose is floss silk. The following quotation is from a paper I read at our last State meeting in reference to use of this material:

"In the treatment of dead teeth that have no fistula, I find lightly waxed floss silk, with which to temporarily fill fangs, the most useful and satisfactory of anything I have ever tried. After the fangs are properly prepared and wiped out with creosote, take a piece of floss about two inches long, placing an end in the cavity, then with a perfectly smooth nerve broach catch the end of the silk and gently press it up to the apex; withdrawing the broach a little, press it up again; the silk will invariably go with it. Repeat this until the fang or fangs are completely filled, leaving an end in the cavity by which the whole can be readily removed whenever necessary. It is always best to use a separate piece for each root. In lower bicuspids and molars, when the root can be opened at all, the silk will be found to be particularly suitable, the flatness not preventing the almost perfect adaptation of the silk. Possibly its chief merit is that no air is ever pumped up with it, and the ease with which it can be removed. I believe it can also be used successfully as a permanent filling for roots, certainly when trouble is anticipated at some future day."

In the sixth front teeth I think better results are obtained by the use of wood, both as a temporary and permanent filling. The ease with which it can be accurately fitted, both as regards length and size of root, making it particularly suitable. As a temporary filling the end should project from the cavity just sufficient to be grasped by a pair of delicately pointed forceps. After inserting the wood well up to the end of the root, cotton should be packed around it and the whole hermetically sealed with gutta-percha stopping. This should remain at least ten days or two weeks, before the permanent filling is inserted. If there is the slightest indication, however, of periostitis, the gums adjacent should be freely painted with iodine, to which one-fourth part tinct. aconite root has been added. Care should be used to prevent the iodine extending further than desired. If inflammation continues, remove the filling and commence a more conservative treatment. By

that I mean a more gradual sealing of the cavity. This can be done by passing well up into the root a medium size piece of twine, around which cotton should be firmly packed, the first piece dipped in creosote, the whole being capped with gutta-percha stopping; the twine is then withdrawn, leaving a small open canal which will gradually become closed by the flattening of the filling. The gums should be painted once a day until all unfavorable symptoms disappear.

As a permanent filling for roots that are round or nearly so, well seasoned hickory I believe to possess advantages superior to anything else. We frequently find that the nerve canal near the apex is so exceedingly small that it is almost impossible to force any filling material up to the end of the root, at least with certainty, and again so large that we are in danger of forcing the filling through the foramen. In both of these conditions wood, I believe, will be found to work with certainty. After being satisfied as regards its perfect adaptation to the root to be filled, by actual trial, pass the edge of a knife lightly around the wood about one-fourth of an inch from the end to be inserted, bend it over at this point without breaking, and then insert; a few slight taps with a mallet will send it home, and a slight twist between the fingers will break it off at the place marked by the knife, and the root is permanently filled even to the apex. Either gold, gutta-percha or oxy-phosphate of zinc may follow, although I prefer the last two in the order named, which gives a solid foundation for the gold.

We come now to another and more troublesome condition of devitalized teeth. Those from which a discharge has been going on possibly for years, where there is no fistulous opening or ever has been, and while they may have given no trouble whatever, the slightest attempt at closing up the cavity is followed by serious disturbance, which if persisted in, results in periosteal inflammation and alveolar abscess, and while in a few cases this might be somewhat excusable, very much doubt its advisability in any case. My prac-

tice has been to "make haste slowly," first being careful to remove all foreign substance from the roots, and cleaning them out as perfectly as possible without closing them up, then thoroughly inject tepid water to be followed with alcohol. Creosote should be introduced on a piece of cotton which must be packed very lightly as far up as possible, this to be changed every day, packing the cotton more firmly at each sitting. As soon as the tooth will submit to it, fill, leaving an open canal as already described. The gums should be painted with the iodine preparation every day. If, after a tooth has been permanently filled, active periosteal inflammation should take place, depletion by freely scarifying the gums; painting the scarified surface with iodine will sometimes give relief. If, however, this should fail, and the tooth is a valuable one, then trephining the alveolus will have to be resorted to. This can best be accomplished with a sharp spear-shaped drill; the only pain experienced is in passing through the soft parts.

In the next and last condition of which I shall speak, where there is a fistulous opening and a clear passage can be established through the cavity, the treatment is simple. Force either creosote alone, or combined with an equal quantity of iodine through the cavity until it is plainly seen coming from the fistula, and fill, permanently, which can be done with perfect safety. An easy method to accomplish this, is to take a pellet of cotton saturated with the preparation and place it well into the cavity, all excess next the wall taken up, and a piece of gutta-percha stopping, warmed and flattened placed over the cavity. This should be sufficiently soft to adhere to every part of the tooth with which it comes in contact. A stout bur or drill should previously be wrapped tightly with cotton, just to comfortably fit the cavity. Place this in the center of the gutta-percha, and gently but firmly press it into the cavity, carrying the gutta-percha and cotton before it. If the passage is clear, this will be found to work with perfect satisfaction and in the most positive manner.—*Southern Dental Journal.*

## ARTICLE V.

### *Oxy-Phosphate of Zinc.*

BY E. G. BETTY, D. D. S.

One of the most useful materials in the daily practice of the operator is the oxy-phosphate of zinc. So useful and reliable is it, that it has quickly superceded the oxy-chloride, formerly so greatly in demand to meet the requirements of just such an article. As the material is comparatively new, and its manipulation somewhat different from that of the chloride, it may not be out of place to hazard a few suggestions in regard to its manipulation and uses. The properties depend, of course upon the chemical process that takes place when the powder, oxide of zinc, and the solution of phosphorous acid, are mixed together. This change, whether it is solely chemical, or an obscure process of crystallization, or a combination of the two, one following the other, is beyond the province of this paper. That question is left for the chemist, who is welcome, at any time, to give us the result of his investigations. The intention is merely to outline the practical; that, to most operators, is, after all, of the most value. So far as as the mixing of the oxy-phosphate is concerned, it may be laid down as a rule, that the powder is in all cases to be added to the solution. The required stiffness or flaccidity of the mixture is to be governed by the amount of powder added to the liquid. After repeated trials, and an aggravating experience, this method has been found to give the most satisfactory results. In very large cavities, not encroaching too near the pulp, when the intention is to fill with gold at the same sitting, it is desirable to guard against the shock of violent and sudden thermal changes. As a barrier between the metal and the dentine, it subserves a good purpose. Should the dentine be very sensitive, the oxy-phosphate is better made stiff and quickly pressed into place with a suitable burnisher. When

mixed stiff the affinities of the base and the acid are so nearly or completely satisfied that there does not remain upon the surface of the plastic bolus sufficient acid to produce the sudden and acute pain that so many patients complain of. This pain, which so many operators make the ground of their objection to the use of the oxy-phosphate, is due to two different causes: First, when the material is made thin the acid predominates and immediately attacks the sensitive surface of the dentine in the cavity. Second, even though the phosphate be made stiff, it may at the same time be so far below the tooth in temperature that, when introduced, it will cause pain by immediately absorbing heat from the tooth. This is reasonable to suppose, because the cavity is dry and the bolus (if it may be termed,) is wet and of lower temperature. In the first instance the pain may be avoided, to a considerable degree, by previously lining the cavity with the dry powder. The thin mixture can then be poured in safely, the powder receiving and combining with the free acid, thus protecting the dentine. Should the cavity be in the upper jaw, the thin mixture can, with little difficulty, be flowed in by first touching some interior point of the cavity with a small quantity of it. The bulk once touching this point of attraction, will readily flow into place. If made thin, the phosphate will necessarily require more time to set and become hard enough to withstand the percussion of the mallet. In the second case the materials ought to be prepared on a heated surface, to raise the temperature of the mass near that of the tooth. This is simply done by mixing it on the bottom of a tumbler previously containing hot water, or upon a square of glass or porcelain that has been warmed near the stove. The addition of heat to the mass, however, will hasten the setting, and it will be found necessary either to add less power to the liquid, or be very, very expeditious in introducing it into the tooth. A little close observation will enable the operator to determine just the required consistency, and the rapidity of crystallization when mixed warm.

The adhesion of the mass to the instruments while handling it, is very annoying to those who are too lazy to slightly oil the instrument before using it. Instead of being an objection, this very adhesiveness is a desirable quality, and often serves us well when the cavity is of poor retaining shape, and we wish to fill temporarily. In such cases the adhesion will be found greatest when the mass is mixed thin. For capping an exposed pulp successfully there is probably nothing better than the oxy-phosphate, if it is properly handled. In the estimation of the writer, many failures are due to reckless excavation, and the consequent pain to which the pulp and surrounding dentine are subjected. The less pain attending the capping of the pulp, the greater will be the chances of ultimate success. After the excavation is completed the pulp can be covered with a thin skin of gum by flowing over it a little of the compound tincture of benzoin. The walls of the cavity may also be coated with it, a few moments only being required for the evaporation of the alcohol. It may be expedited with the warm air current, gently and gradually applied. The covering of gum may be thickened, if desirable, by two or three applications of the tincture at short intervals. A small quantity of the phosphate may now be mixed thin, on a warmed surface, and flowed directly over the exposure, allowing it to run over the edges so that it will bear upon the solid dentine. When hardened the capping may be trimmed with an excavator. The cavity can now with safety be filled as an ordinary one, without fear of producing pressure on the pulp. It is best to fill with a stiff bolus of the phosphate and allow it to remain for a year or more, as the material is good for that length of time in the majority of mouths; longer in some. By proceeding in the manner above detailed, the operator will avoid producing that "shock" to the pulp that is caused either by placing in direct contact with it an irritating acid, or suddenly reducing its temperature. If the pulp is outraged by careless handling and its sensibility subjected to a severe trial, we

cannot hope for, much less expect, it to recover its wonted functions. It may not be generally known, but it is nevertheless a fact, that a violent toothache, due to an exposure, may be almost instantly controlled by an application of the compound tincture of benzoin. It was this fact that suggested to the writer the propriety of using it as a preliminary covering for the pulp; and experience has proved it very efficacious in many instances. It also serves very well when applied to the dentine over and around the pulp, during excavation, taking care not to flood the cavity with it while cold. The pledget of cotton saturated with it can be warmed over the lamp. The soothing effect of this tincture may be due, in some degree, to a slight anodyne property of some of its ingrediments. It is probably more likely that its effect is owing to the evaporation of the alcohol, leaving a film of sticky gum that completely protects the surface from the atmosphere. Be that as it may, it is well worthy of a trial, and will not be found ungrateful. However, it was not intended to discuss the treatment of exposed pulps, and the digression may be pardoned on the ground that it is difficult to exclude it when considering the subject of this article.

Fossiline, the English preparation of the oxy-phosphate, (for it can scarcely be anything else,) that was introduced a year and a half ago into the United States, is a very good one. It requires some patience to obtain the best results from it, as it sets very rapidly. If mixed too stiff it will not bear much manipulation while introducing it, the tendency being to crumble or granulate, and, in consequence, losing its integrity as a mass. This, in fact, is true of all the oxy-phosphates, but is not necessarily an objection to it, for it can be guarded against. The phosphate is a very good material with which to fill very sensitive teeth, when it is desirable to postpone, indefinitely, the introduction of a metallic filling. For this purpose it is much superior to the gutta-percha fillings. After six months or a year, the greater portion of the phosphate can be removed and the

metallic filling put in over the remainder. The sensitiveness will by this time have been greatly modified, or will have disappeared. A great deal can be said about this material and its many uses as a temporary filling for dead teeth, sensitive ones, exposed pulps, etc., with which the reader is familar, making it superfluous to repeat.—*Ohio State Journal of Dental Science.*

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### *South Carolina State Dental Association*

The Thirteenth Annual Meeting of the South Carolina State Dental Association will be held at Aiken, South Carolina on the 17th day of April. 1883.

Dr. C. C. PATRICK, President, Charleston. Dr. S. G. THOMSON, 1st Vice-President, Abbeville. Dr. W. P. O'NEILL 2d Vice-President, Charleston. Dr. A. P. Johnston, Cor. Secretary, Anderson. Dr. R. ATMAR SMITH, Treasurer, Charleston. Dr. G. F. S. WRIGHT, Recording Secretary, Columbia.

*Voluntary Essays.*—Dr. J. B. Patrick, "Interstitial Growth." Dr. W. P. O'Neill, "Effects of Syphillis on the Teeth." Dr. B. H. Teague, "Cheap Dentistry." Dr. J. B. Patrick. Jr., "Dental Progress.

*The Executive Committee.*—Dr. B. H. Teague, Chairman. Aiken, South Carolina, Dr. J. Rryerson Smith and Dr. W. C. Wilbur, will arrange with Railroads and Hotels.

A written report is expected from the following Committees :

*Operative Dentistry.*—Dr. A. P. Johnstone, Chairman : Drs. J. T. Calvert and E. C. Jones.

*Mechanical Dentistry.*—Dr. R. Atmar Smith, Chairman ; Drs. B. J. Quatlebaum and R. C. Roberts.

*Dental Hygiene*—Dr. H. D. Wilson, Chairman : Drs. A. C. Spain, and J. R. Thompson.

*Dental Education.*—Dr. L. Dotterer, Chairman ; Drs. G. B. White, and S. G. Thomson.

Two beneficiary Students of Dentistry, on application to this Association, are recommended each year. Your attention is called to an act of the General Assembly, approved February, 1875, entitled "An Act to regulate the practice of Dentistry and protect the people against Empiricism in South Carolina."

At the above time and place, one State Board of Dental Examiners will be in session, viz: Dr. W. S. Brown, of Charleston, President of the Board: Dr. J. B. Patrick, Dr. H. D. Wilson, Dr. G. B. White and Dr. G. F. S, Wright.

*Secretary of the Board.*

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## *The Texas Dental Association.*

The annual meeting of the Texas Dental Association will be held in Dallas, commencing the first Tuesday in May, 1883, and continuing for three days. All Dentists in good standing are cordially invited to meet with us.

*Officers.*—W. R. CLIFTON, President, Waco. J. L. FOUNTAIN, Vice-President, Bryan. J. H. GRANT, Corresponding Secretary, Austin. J. B. CHESS, Secretary and Treasurer, San Antonio.

*Executive Committee.*—WM. STILES Austin. W. S. CARRUTHERS, Galveston. G. S. STAPLES, Sherman.

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## *Dental Society of the State of New York.*

Members of the profession who purpose appearing before the Board of Censors for examination for the certificate of this Society, should immediately communicate their intention to Dr. Frank French, Secretary of the Board, at Rochester, and report to him personally the morning of May 8th, 1883, at the Delevan House, Albany. The examinations will begin at 10 A. M. and continue throughout the day or until the list is exhausted. No examinations will be held during the session of the Society.

J. EDW. LINE,

*Secretary.*

# EDITORIAL, ETC.

*University of Maryland Dental Department.*—The Seventy-Sixth Annual Session, Commencement of the University of Maryland, but the first of the Dental Department, was held at the Academy of Music, Baltimore, on the 15th of March, 1883. A very large audience was present, and upon the stage, which was set with an elegant garden scene, were seated the Faculty of the University and a large number of guests, many of them from a distance. The exercises were opened with prayer by Rev. J. S. B. Hodges, S. T. D. of St. Pauls' P. E. Church, after which the mandamus was read, and the dental graduates announced by the Dean of the Dental Department, Prof. F. J. S. Gorgas. The degree of 'Doctor of Dental Surgery' was then conferred upon the following gentlemen, thirty-four in number:

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| J. Hardin Baldwin, | *Kentucky.* |
| Austin F. Banks, | *Michigan.* |
| Bartow B. Breeden | *South Carolina.* |
| Paul Campbell, | *New York.* |
| Frank G. Conklin, | *New York.* |
| Joseph W. Curtis, | *New Jersey.* |
| Erastus S. Dashiell, | *Maryland.* |
| Newton W. Denton, | *Virginia.* |
| R. Delamer Dodson, | *Pennsylvania.* |
| John F. Garrett, | *North Carolina.* |
| Godfrey J. Grempler, | *Maryland.* |
| George W. Hotaling, | *New York.* |
| R. Arthur Hungerford | *Maryland* |
| Atwell T. Jarrett, | *Virginia.* |
| George Wilfred LeDuke, | *Massachusetts.* |
| Charles T. Lindsey, | *Virginia.* |
| Frank B. Maphis, | *Virginia.* |
| Wattie B. McGirt, | *South Carolina.* |
| Edwin J. Miller, | *Minnesota.* |
| Eli H. Neiman, | *Pennsylvania.* |
| A. Lee Penuel, | *Maryland.* |
| Walter W. Rowe, | *Pennsylvania.* |

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| Hippolyte C. Salles, | *Louisiana.* |
| Carlos N. Sanchez, | *Cuba.* |
| Julian C. Smith, | *South Carolina.* |
| Walton O. Smith, | *Virginia.* |
| Myron W. Snyder, | *New York.* |
| Walter Stuart, | *Kentucky.* |
| Newton Addison Teague, | *South Carolina.* |
| Norman B. Tipton, | *Louisiana.* |
| J. Everett Toombs, | *Massachusetts.* |
| George Andreas Volck, | *Maryland.* |
| Fredrick Allen Weaver, | *Massachusetts.* |
| August F. L. Wietfeldt, | *Germany.* |

All the graduates, without a single exception, had attended *a full course* in the Dental Department.

Professor Gorgas announced the prizes in the dental department. The University Prize, a gold medal for the highest number of votes at the final examinations was awarded to John F. Garrett, of North Carolina; J. Edwin Miller, of Michigan receiving honorable mention. The S. S. White Prize, a dental engine, was awarded to F. Austin Banks, of Michigan; Frank G. Conklin, of New York, and J. E. Toombs, of Massachusetts, receiving honorable mention. George A. Volck, of Maryland, received the Snowden & Cowman Prize, a set of forceps. Myron W. Snyder, of New York, was awarded the Wilkerson Prize. W. O. Smith, of Virginia, receiving honorable mention. Eli H. Neiman, of Pennsylvania, received the Genese Prize, a set of instruments,. The "*Dental Register*" Prize was awarded to F. G. Conklin, of New York, and the "*Southern Dental Journal*" Prize, to Walter W. Rowe, of Pennsylvania.

Hon. John V. L. Findlay, Congressman elect, delivered the address to the graduates, in which he spoke of the great importance of the profession they had chosen, emphasizing the fact that there was yet much to be learned by the careful student of the ills which man is heir to, etc. He also called particular attention to the present age of skepticism, and the fact that the physician who was a thorough believer in the immortality of the human soul would necessarily be far more conscientious than he who believed that man was simply a piece of animated clay. He concluded as follows: "May yours be a career of honor, and may all the gold that glistens in your pathway, not be in the teeth of your patients, but may you receive for every plug a *quid pro quo.*"

The exercises closed with the benediction, pronounced by Rev. Dr. Hodges.

The Alumni of the Dental Department of the University have elected the following officers: President, Dr. R. Arthur Hungerford, of Maryland; Vice Presidents—R. D. Dodson, of Pennsylvania; Dr. G. I. Grempler, of Maryland; Dr. J. F. Garrett, of North Carolina; Secretary and Treasurer, Dr. A. Lee Penuel, of Maryland.

The fifth annual reunion and banquet of the alumni association of the University took place last evening at the Eutaw House. Dr. N. S. Lincoln, of the class of 1859, and now located at Washington, D. C., delivered an address on the advantages of a classical education as a preliminary to medical study. After the reunion of the alumni of the University from different parts of the country, members of the graduating classes of the present year, and a number of invited guests, sat down to a banquet. On the removal of the cloth several toasts were given and responded to.

The success of the first Session of this Dental Department, which ended on the 15th of March last, is unprecedented in the history of any dental institution. The matriculates for the Session numbered sixty-six, all of whom, without a single exception were dental students and not matriculates of the Medical Department, or of any other medical college. Of the graduates eighteen had attended their first session at other Dental Colleges.

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*A Useful Invention.*—Dr. William Farmer, of Wytheville Va., has invented a mechanical appliance which will prove of great value to dental practitioners who practice outside of their regular offices. This invention consists of attachments which convert any ordinary chair into a convenient "dental chair," by elevating and adjusting it to suit the size of the patient and the locality of the work to be done in the mouth. The entire appliance is light, neat, and compact, capable of being packed in the space of a few inches square, and at the same time strong and durable. During commencement week, Dr. Farmer exhibited his appliance at the Infirmary of the Dental Department

of the University of Maryland, where it was greatly admired for its convenience and usefulness.

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# MONTHLY SUMMARY.

*Teeth Injured by Tobacco.*—" I was taught that the use of tobacco in any form was not injurious to the teeth, and in all the literature of the profession I have found nothing allnding to what I desire to present to the profession; namely, the evil effects upon the teeth, caused by the constant use of tabacco. My attention was first drawn to this evil just one year ago this month, when I was filling the teeth of a patient who has for years been in the habit of smoking and chewing a great deal of tobacco.

" The injurious effects are not very noticable until the person has been using the weed for about fifteen years, but the use of the pipe to excess will show its injurious effects in less time. Tobacco chewing is the most injurious, as the tobacco acts as an irritant in two ways, mechanically and by its properties—mechanically by particles of the tobacco being forced between the gums and the teeth. We have proofs of the irritable effects of tobacco in snuff. The direct effect of using tobacco is the recession ot the gums of all the teeth, but more especially those on the side of the mouth used most in chewing the tobacco. The sequel to this recession may cause the loss of one or more teeth, by a diseased condition of the pulp, resulting from its being irritated by having the neck of the tooth and the root exposed to thermal changes in food and in the air we breathe. Exostosis and calcification may result.

" Tobacco chewers' teeth wear away on the grinding surface rapidly, caused by the gritty substances naturally entering

into the tobacco. The gums recede and are red and congested, and underneath the gum a narrow line of dark tartar is nearly always present, and particles may be found still further toward the apex of the tooth.—*Dr. John G. Harper, in Southern Dental Journal.*

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*Separation of Silver from Alloys.*—Mr. Solthien describes the following simple method for separating silver from alloys:

The silver-holding alloy or metals are dissolved in the least possible quantity of crude nitric acid. The solution is mixed with a strong excess of ammonia and filtered into a high cylinder, provided with a stopper. A bright strip of copper, long enough to project beyond the liquid, is next introduced, which quickly causes separation of pure metallic silver. The reduction is completed in a short time, and the reduced silver is washed, first with some ammoniacal and then with distilled water.

The more ammoniacal concentrated the solution was, the more rapid is the reduction. The strip of cotton should not be too thin, as it is considerably attacked, and any little particles which might separate from a thin sheet would contaminate the silver.

The operation is so simple that it seems preferable to all others for such operations as the preparation of nitric of silver from old coins. etc. Any accompanying gold remains behind during the treatment of the metal or alloy with nitric acid, chloride of silver (produced by the impurities [H C I] in the nitric acid) is taken by the ammoniacal solution, like the copper, and is also reduced to the metallic state; and whatever other metal was not left behind, oxodized by the nitric acid, is separated as hydrate (as lead, bismuth) on treating with ammonia. Any arsenate which may have passed into the ammoniacal solution is not decomposed by the copper.—*Arch. d. Pharm.*

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*A Conclusion Not Warranted by Facts.*—The *Independent Practitioner* says that "Mr. William J. Thulman, a druggist of Buffalo, recently came to his death from a singular cause. While eating his dinner a large amalgam filling in one of his

teeth became detatched and was swallowed. He immediately expressed his apprehension of trouble from it, but felt no special inconvenience for some days, when he began to experience pain in the abdominal region. The symptoms became aggravated, peritonitis, ensued, and he finally died after much suffering. Autopsy was held by prominent physicians, when it was found that the irregularly shaped mass had lodged in one of the lower folds of the ilium, and had produced an ulcer which had eaten its way through the intestines, and finally caused his death."

One of the "prominent physicians" who was present at the autopsy says that neither an "irregularly shaped mass," or anything that looked like an amalgam filling was found, although diligent search was made. We are inclined to think that the conclusions in the case are not warranted by the facts. —*Dental News.*

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*Gold Alloy.*—Dr. W. H. Dorrance prepares gold solder after this manner: take of pure silver one part, of zinc two parts and of copper three parts. Melt the silver and copper together and add the zinc slowly, in small pieces, allowing all the fumes to pass off. If, after thorough mixing, this is thrown into water, it will separate into small pellets. With these reduce the gold to the proper degree of fineness. If pure gold is used, the number of parts out of twenty-four which are taken will express the fineness of the solder in carats. Twenty parts of gold will make 20-k. solder; sixteen parts, 16-k. solder, etc. If U. S. coin be used, there will be two parts more of alloy, and twenty parts of gold will make but 18-k. solder. After melting it may be run into an ingot, when it will readily roll out into a plate of any desired thickness.

We have used solder made in this manner, and can express our entire satisfaction with it. It bears an excellent color, flows easily and is very strong. We are under obligations to Dr. Dorrance for this formula, as well as for other courtesies.—*Independent Practitioner.*

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*Filling Over-Exposed Nerve.*—If the tooth has ached only a little, say two or three times, I rinse out the cavity with warm

water ; then wipe it with a little water and baking soda. Open the cavity as much as it is to be when filled. Remove the decay all around the margin of the cavity, and some from not near the nerve locality. Leave any decay over the nerve that is not loose enough to wash away. Wipe cavity dry, Then wipe it with creosote. Wipe out the creosote, nearly dry. Now wipe cavity with thick solution gum sandarach. Wipe this varnish away from walls at margin of the cavity. Now fill cavity with water-tight amalgam, packing it all about the pulp location, very gently ; the pulp will get covered with the filling without direct pressure. Care needed all the time to avoid pressure of the pulp. In filling margins, draw the amalgam towards the outer edges and let some waste by dropping outside ; in this way the varnish at the edges is removed.

Nine cases out of ten such cases remain comfortable after I have treated them.

The soda quiets the pulp by destroying acidity.

The varnish excludes air, and is a non-conductor of heat and electricity.—*H. S. C., in Missouri Dental Journal.*

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*A Dentist's Wife's Death.*—Mrs. Laura B. Watts, wife of Dr. E. M. Watts, of Portsmuth, expired while under the influence of chloroform, administered by her husband to have her teeth extracted. After the operation she spoke a few words and died instantly.—*Local Paper.*

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